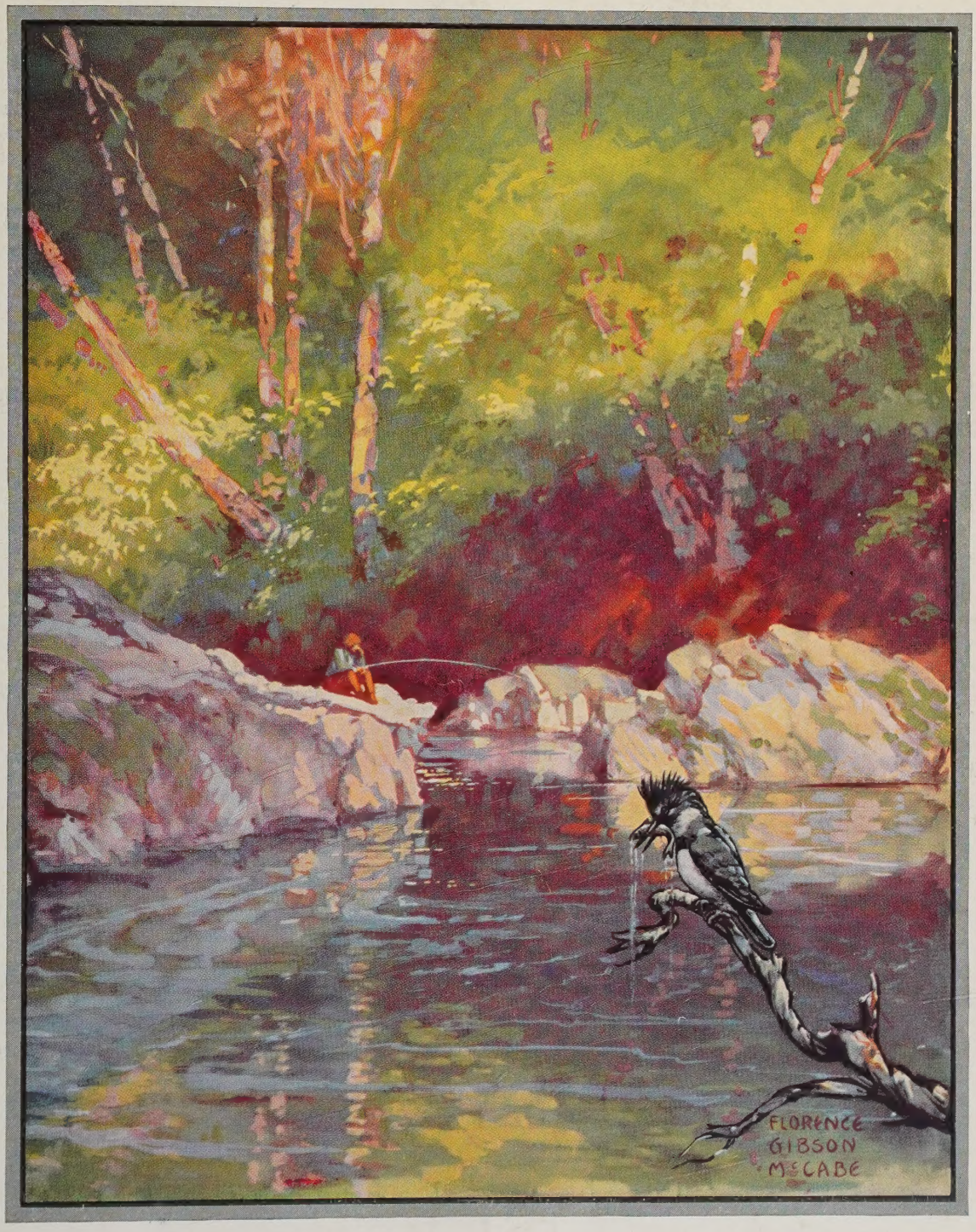
NATURE MAGAZINE



AUGUST 1929 35¢ VOL. 14, NO. 2

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Organized to Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

The American Nature Association seeks to find for Nature Study an essential place in every School and in every American Home. It is working for Forest and Wild Life Protection along sane, economic lines. It believes that clean, healthful Out-of-Door Recreation is the key to Good Citizenship

AT THIS time of year, when most of the nation is on wheels, it is appropriate to report on developments in the field of outdoor advertising and the campaign for its restriction. One of the first groups which should recognize the public rights in this connection are the gasoline and oil companies. We were pleased to receive from Herbert L. Pratt, Chairman of the Standard Oil Company of New York, a letter in comment upon our article in the April issue. Mr. Pratt reaffirmed the stand of his company against placing their billboard advertising in scenic places, and his letter adds:

"For your information, would say that only today I wrote our advertising people telling them I personally wished the lists of all billboards, even in municipal centers, that might be objectionable, and asking further if it is not possible to control the size of billboards at certain stations, which we do not own or control, to see if a smaller board, even in towns and cities, cannot be adopted which would serve as useful a purpose as the larger signs."

* * *

Those who are appreciative of the work being done toward the elimination of objectional rural boards may not realize that much is accomplished in the face of considerable odds and with little or no funds. Against this effort is pitted an organized industry with ample funds. The National Committee for the Restriction of Outdoor Advertising has been carrying on its work largely through volunteer effort. If its work is to continue in any proportion to the needs, it requires financial support. Supporters of the movement are earnestly requested to write to the Committee at 119 East 19th Street, New York City, or to Nature Magazine, relative to the material available from the Committee and to membership in it, to the end that its work may be furthered.

* * *

At the recent meeting in Philadelphia of the Garden Club of America, the more than 1200 women present reaffirmed their stand for billbard restriction and endorsed a pledge which declares:—"As a practical protest against the abuse of our countryside by advertising, I shall give special favor to products not advertised on the landscape."

* * *

Mr. M. Q. Sharpe, Attorney-General of South Dakota, recently ruled against the placing of billboards on the highways of his state upon the rights of way 66 feet wide dedicated primarily to the purpose of public travel. In further comment on the issue, Mr. Sharpe says:

"There is a more important question, however, which we have not yet decided. Many of the signs are placed just outside the right-of-way upon private lands and they obstruct the vision, cause drifts of snow, and weeds, almost as much as if they were six or eight inches inside the right-of-way line. I am satisfied that under its police powers the state could pass a law prohibiting the signs along highways where it could show actual injury to the use of the highway; but would probably have to make compensation to the private owners."

* * *

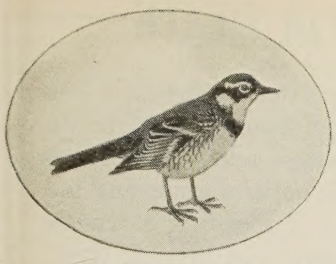
The coming of the warmer weather does not seem seriously to have affected the national interest in the vote for a National Flower, our campaign which is proving our hopes for it as an educational endeavor. Polls October 31, 1929.

The following resolution was adopted at the Council Meeting of the General Federation of Women's Clubs by the unanimous vote of two thousand delegates representing two million American women:

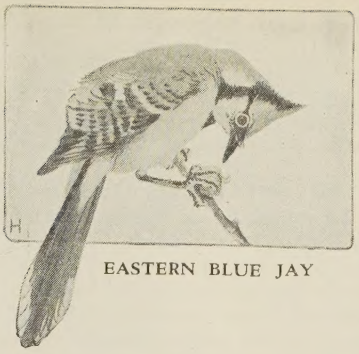
WHEREAS, we realize the value of outdoor beauty to the people of America, and believe that this beauty is today sacrificed for advertising purposes, therefore

BE IT RESOLVED, that we renew our protest against the use of the landscape for advertising and urge the restriction of all outdoor advertising to commercial districts, and

BE IT FURTHER RESOLVED, that we recommend that club women give consideration to those firms which do not desecrate the landscape with advertising.

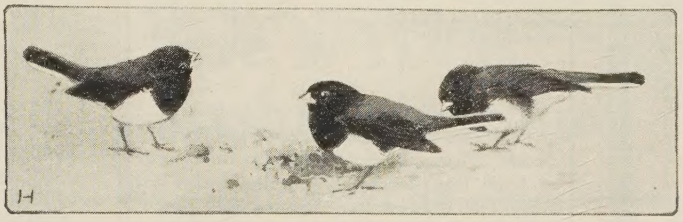


VARIED THRUSH



EASTERN BLUE JAY

THE CHEWINK



SNOW BIRDS OR JUNCOS

BIRD AND ANIMAL PAINTINGS

By R. Bruce Horsfall

SPECIAL LIMITED EDITION NOW AVAILABLE IN CONVENIENT FORM

MANY readers of Nature Magazine have asked when the beautiful color pictures of birds, mammals and insects that have appeared in Nature Magazine would be available separate from the Magazine. The demand has been so insistent that this is the result:

A beautifully printed book containing 168 pictures in full colors, three and one-half by two and one-half inches, and a beautiful frontispiece has been printed and is now available.

Each picture is accompanied by concise description of the character and habits of the subject.

Helpful suggestions are included to show the use of the book for school, camp, home and other educational purposes.

Despite the high cost of color plates and printing all this will cost the readers of Nature Magazine,—

ONLY ONE DOLLAR

American Nature Association
1214 Sixteenth Street, Washington, D. C.

Enclosed please find $..... for ..... books of R. Bruce Horsfall's Bird and Animal Paintings.

Name.....

Street Address.....

City.....

State.....

Please make address complete and legible

There's an air of hospitality that you'll like

AT THE HOTEL

PICCADILLY

227 WEST 45th STREET

• AT BROADWAY •

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ADJACENT TO EVERY ACTIVITY

600 BRIGHT SUNLIT ROOMS

EACH WITH BATH, ELECTRIC FAN, ICE WATER

SINGLE ROOM AND BATH $3.00

DOUBLE ROOM AND BATH $4.50

EXCEPTIONAL RESTAURANT • AND LUNCHEONETTE

WIRE AT OUR EXPENSE FOR RESERVATIONS

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TOBIAS LATZ INC.

TREES

—the greatest natural resource of the nation

Do you know enough about them—about the past, present and future of forestry?

The Forestry Almanac

will tell you—show what your state has done—what experts think the nation must do.

Send $1.00

postpaid

THE AMERICAN TREE ASSOCIATION

1214 16th St. N. W., Washington, D. C.

EVERYONE is going places and doing things during August. The steady stream of motors through the National Parks and other of the nation's wonderlands is rivalled only by the fast flow of Americans across the surface of Europe. Bus and railroad are jammed with citizenry off to send their friends postcards from different "vacation-lands", labelled with the famous legend: "Slept last night under two blankets."

* * *

The Chicago and Northwestern-Union Pacific System have stepped up the speed of their trans-Rocky Mountain Trains to bring the Pacific from two to five hours nearer Chicago. The Portland Limited reaches Portland, Oregon in 63 hours, and travels eastward in 61¼ hours, without extra fare. The Overland Limited has cut down the distance from San Francisco to Chicago to 58 hours, and is worth the $10 extra. Other crack trains are the Los Angeles Limited, not an extra fare train, 63 hours west bound, and the Denver Special, now but twenty-five hours from Chicago, St. Paul and Minneapolis are likewise hooked up by faster trains with the West Coast. And with the summer fares now in season, it is cheaper to travel than to stay at home.

* * *

The Union Pacific six day tours to Yellowstone and the new Grand Teton National Park are features of travel this season, and are relatively inexpensive. About $72 covers the entire expense from Park entrance to Park exit. In Colorado, this railroad offers a bus tour out of Denver covering Rocky Mountain National Park via Big Thompson Canyon, the Fall River Highway, Arapahoe National Forest and the Lariat Trail. It also recommends taking in the Cheyenne, Wyoming, Frontier Days Round-up, on July 23 to 27, and the Pendleton, Oregon, Round-up, from September 18 to 21, the pride of western cowboy exhibitions. Dust off your chaps, coil your lariat, and let's be off!

* * *

A myth that needs exploding is the old saw that Florida is the hottest place on earth in summer. Reassurance may be taken from the Weather Bureau's figures for a day in June, which was not so rare as the poet suggested. Boston, New York and Washington sweltered under 90° plus temperatures, which lowered only to about 78° even at night, while Miami breezed around under an 86° sun, and a 58° moon. This might suggest slogans for Florida resorts—"Go South to keep cool".

* * *

Germany has followed the lead of America and other European countries in establish-

GAME PRESERVES in DIXIE

IN the coast regions of Georgia and South Carolina the waterways and wild lands provide natural game and fish refuges in a setting of varied attractions and historic tradition. Quail, deer, wild turkey and other game abound in this favorable climate and at readily accessible locations.

The following are examples of properties available, subject to withdrawal or prior sale:

1. A tract of 10,000 acres, 10 percent rice field and backwater reserves, on the railroad and concrete highway about 50 miles from Charleston. Adjoins a preserve owned by the DuPont family. Excellent hunting.

2. About 4,454 acres, bounded on three sides by rivers, located about 35 miles by road from Charleston. Plenty of game; good house.

3. 5,471 acres in Camden County, Georgia. Rolling pineland suitable for propagation of quail, deer, and turkey and forest management.

In many cases forest management may be combined with the primary game features to yield a revenue which will pay all or part of the carrying charges.

We will furnish details or find the property you want.

THE JAMES D. LACEY COMPANY
Barnett Bank Building
Jacksonville, Florida

Subsidiary of James D. Lacey & Co., Chicago, New York, New Orleans, Memphis, Seattle, Montreal and Vancouver

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60 pages

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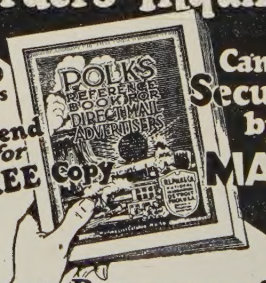

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Gives counts and prices on over 8,000 different lines of business. No matter what your business, in this book you will find the number of your prospective customers listed.

Valuable information showing how to use the mails to secure orders and inquiries for your products or services is given.

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R. L. POLK & CO., Detroit, Mich.

Largest City Directory Publishers in the World. Branches in Principal Cities
Mailing List Compilers—Business Statistics
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ing motor coach tours through the picturesque sections, and the Grand Tour, *a la rubberneck,* may be completed at moderate cost and with excellent results. Hamburg is the terminal. One of the most popular trips includes Berlin, Potsdam, the home of rococo, Dresden, Leipzic, Eisenbach, Nuremberg, Munich, Baden-Baden, Heidelberg, and Frankfort. Conductors versed in English will point out the landmarks. These are all-expense trips, and about $256 will include accommodation at first-class hotels, breakfast and lunch, drives about cities, and, surprising as it may seem, gratuities at hotels.

* * *

It is more the shame for the tourist routes that Ireland is off them, as this country has as much to offer per square foot as any other country. This year the Great Western Railway has instituted a campaign to "See Ireland First", in conjunction with the Irish Tourist Association. After visiting Donegal and northern Ireland, with Slieve League rising sheer 2000 feet above the sea, after seeing Doon, where Ulster kings were crowned centuries ago, and County Wicklow, near Dublin, you will agree that too few people have followed the example set by Caesar. The river Shannon is still flowing, and the mountains of Connemara are purple, now, in the sunsets, and the Killarney and the Kerry coast are harbingers of beauty for those that visit them. Mr. K. W. C. Grand, at 505 Fifth Avenue, New York City, will help work out a pleasing trip at cost to fit the expense book.

* * *

Raymond and Whitcomb Company are offering a trip that only pressing business could serve as an excuse for missing. It is a Round-South America "good-will" tour on the S. S. "Samaria", which begins February 1, 1930, and reaches New York again on April 4. The West coast countries will be visited first after passing from Havana down through the Panama Canal, then through the Straits of Magellan and up to famous Buenos Aires, Rio, the Barbados, Martinique, Virgin Islands and so to New York. The rates run from $1725 to $6450 a person, all-inclusive. In addition to the ship tour, Raymond and Whitcomb Co. offer seven optional tours inland by train or boat, reaching inland sections—the lakes, the mountains and the deserts—which vary in additional expense from $15 to $575. The New York address of this firm is 606 Fifth Avenue, and further particulars can be obtained from them.

* * *

On the bright morning on which the postman leaves this copy of Nature Magazine, the first Glacier National Park tour under the auspices of the American Nature Association will be about three days out, in the midst of alpine flowers, mountain goats, gaping valleys and wonderful food. The tourers are being personally conducted by the representatives of the association, R. W. Westwood, the chief of the editorial staff, and Mrs. Westwood. Reservations may still be made for the second and third tours, which leave Chicago July 20 and August 10, respectively.

Here is *YOUR* Washing Machine.

WE want you to actually experience the thrill of doing a washing on your kitchen table in 15 minutes.

You may actually use the EDENETTE Electric Washer in your home and examine it before you decide that this is the washing machine you have waited for but did not know was built.

The EDENETTE is amazingly compact, portable, efficient and fully guaranteed—the most revolutionary washer built. No drudgery washing the EDENETTE way. And think of it! You can own an EDENETTE for less than one-third the cost of an ordinary washer, and buy it on easy terms if you wish.

To operate, simply pour hot water into the EDENETTE tub, add soap flakes and toss in an armful of clothes, such as you see in the picture. Place over the tub the top containing the motor-driven vacuum-cup and plug extension cord into any light socket. You can forget the EDENETTE, do your household duties, return in 15 minutes or whenever convenient, and the clothes will be beautifully washed. The dip-dip action of the vacuum-cup has done the washing without "fuss", bother or slopping of suds.

Send No Money!

The EDENETTE is easily carried—weighs only 20 pounds. Top when inverted nests into tub—can be stored on pantry shelf or in closet.

Many readers of Nature Magazine who have accepted our unusual offer to try the EDENETTE now endorse it heartily.

This amazing washer must be seen and used to be appreciated. We recommend that you use it in your home as if it were your own at **NO Expense To You.** It will be shipped transportation charges paid. If you are not as enthusiastic about the EDENETTE as thousands of other users just return it at our expense. You are dealing with one of the oldest manufacturers of clothes washers in this country.

This is the time and labor saving device you have needed. Don't delay. Now is the time to examine it FREE. Easy payment terms offered if you wish. **Mail coupon Now.**

Note What These Users Say!

"Your EDENETTE Electric Washer is marvelous—a great time and labor saving piece of machinery. From a hygienic standpoint it is perfect. We have been using the EDENETTE ever since our baby came. He is spotlessly clad with little trouble. We use Ivory Flakes and our clothes are washed spotless white and soft. We like the fact that the use of the machine is so simple that the maid can use it, as no special skill is required. It certainly frees the mother from the usual drudgery with little expense."
Dr. B., New York City.

"Am enclosing my check of $49.50 for the EDENETTE WASHER and I would like to broadcast it that it is the grandest little washer going. I am going to take it to Nantucket this summer as I find it will help us out a great deal as laundry work there is very expensive."
Mrs. L. S. W., Boston, Mass.

"The EDENETTE reached Willows in good shape and has become an indispensable piece of equipment in our household. It just fits my need for the small household wash and does the work well."
Mrs. R. H., Willows, Calif.

"After using your EDENETTE for 5 days as you offered, I am pleased to say that it is the best investment any one could have in their home. It is very simple and does wonderful work.
"I am enclosing a money order for $49.50 in full payment for the EDENETTE."
Mrs. C. A. B., Highland Falls, N. Y.

"I think it is just wonderful, does its work just perfect. I must say that I love to wash with it."
Mrs. L. M., Sandwich, Ill.

Distributors Wanted

Open territory for Exclusive Representatives. If you wish to build your own business, have $300.00 to invest in merchandise, write for Distributors' Prospectus.

EDEN APPLIANCE CORP., 225 West 34th Street, New York City, N. Y.

Send me the EDENETTE clothes washer for 5 days' FREE TRIAL. If I keep it I will pay $49.50 cash or $4.50 at the end of trial period and $5.00 per month for 10 months until paid. Title to remain in you until fully paid.

Name.....

Street.....

City.....

State.....

Dept. 38

All who have seen the Finley pictures in the past will agree that these pictures are the best yet.

An ideal feature for the winter program of Hunting and Fishing Clubs, City Clubs, Nature Clubs; and absolutely unique as a private entertainment.

WONDERFUL LECTURE *on* WILD LIFE

Camera Hunting on the Continental Divide With Thrilling Moving Pictures by WILLIAM L. FINLEY Famous Explorer and Lecturer

who made these remarkable pictures on the two recent Pack-Finley expeditions into the northern part of the Rocky Mountains, under the auspices of the American Nature Association, will lecture with them personally during the coming season of 1930

You who have read the story of the expedition, appearing in Nature Magazine during 1928 and again in the recent 1929 issues, will be more than ever eager to see these pictures and hear Mr. Finley. Rocky Mountain Goats—outwitted by the use of a goat disguise, photographed within 50 feet. Moose—that threatened the cameraman, and at one time came too close for his comfort. Beaver—photographed in the wild, cutting branches and building a dam. Bighorn Sheep—high up on the mountain passes. Pronghorn Antelope—photographed from a pursuing automobile travelling at 45 miles an hour. Herd of Elk—fording a river. Bears—raiding the camp. Conies, deer, marmots, ptarmigan, jays, Franklin grouse or fool-hens, and other birds of the high peaks.

Dates for the coming season should be arranged as soon as possible by addressing

EXTENSION DEPARTMENT, AMERICAN NATURE ASSOCIATION
15 BOUDINOT STREET, PRINCETON, N. J.

When on the subject of New England and environs, the home of the "biggest little mountains in the world", we might mention an ideal All-New England tour which has been suggested. It includes a trip up the Hudson to Albany, hence by rail to Lake George, and from there into Lake Champlain to Burlington, Vermont. Bus takes you across the Green Mountains to St. Johnsbury or Wells River, Vt., then either rail or bus covers the White Mountains of New Hampshire, particularly Crawford Notch, ending up at Portland, Maine. One can then travel up the coast by rail to Mt. Desert, in Lafayette National Park, and ship from Bar Harbor by boat for Boston, whence a tour of Cape Cod, with old Provincetown the goal, may precede a "westward-ho" journey on the bus lines or the New York, New Haven and Hartford Railroad across the much-heralded Berkshires into the Connecticut River Valley. A delightful rail trip down the valley will add Connecticut to the list of conquered states, and you can go home satisfied with a section well done.

* * *

We would like to get the opinions of our readers on a possible all-expense European Nature tour, under the auspices of the American Nature Association. It possibly would take a form similar to that led by L. Raymond Talbot, Brookline bird lover, whose articles on his European adventures have appeared recently in Nature Magazine. We frankly ask for advice on what length of tour would be deemed most suitable, what countries should be visited, and how large the party should be. If interest is evoked by the idea, there is more than a fair chance that such an ambitious trip may become a reality. Write to D. A. Brall, the travel editor.

* * *

The Eastern Steamship lines offer attractive tours into the northeastern section of United States and Nova Scotia for those fond of sea travel without too much roughness and too many days away from land. The usual all-year round service between New York and Norfolk and Boston, and between Boston and Yarmouth.

AMERICAN NATURE ASSOCIATION
1214 Sixteenth St. N. W.
Washington, D. C.

I desire membership in the American Nature Association, including NATURE MAGAZINE each month, and such bulletins and information as are given to members. I will remit $3.00 for one year's dues upon receipt of your bill.

90% of the annual dues is designated for subscription to the magazine

Name.....

Street.....

City.....

August

AMERICAN NATURE ASSOCIATION
1214 Sixteenth St. N. W.
Washington, D. C.

I enclose $3.00 for membership in the American Nature Association for one year, including NATURE MAGAZINE each month, and such bulletins and information as are given to members.

90% of the annual dues is designated for subscription to the magazine

Name.....

Street.....

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August

Mr. Caldwell Photographing the Grand Canyon

THE
AMERICAN NATURE ASSOCIATION
announces two new programs by

GUY C. CALDWELL

Rocky Mountain Guide Naturalist Lecturer

(Many bird and animal calls given)

COLOR VIEWS MOTION PICTURES AUTOCHROMES

Subjects now available

1. Wild Life in the Rockies.
2. Bird Songs and Wild Flowers.
3. Trees—Conservation, Care, Identification.
4. Grand Canyon, Color Movies and Stills.
5. Cornwall—Land of Pasties and Cream. Bird Life Abundant.

OF Mr. Caldwell's 7 years in England, 4 years were spent in Cornwall, terminated by the outbreak of the World War. The fruit of this invaluable research work is yours in a delightfully illustrated lecture.

During the summer Mr. Caldwell conducts camps for boys (9-18) and for adults in the Rockies. Ask for folders.

THE AMERICAN NATURE ASSOCIATION
15 Boudinot St., Princeton, N. J.

You're Under Cover...

AFRAID . . . with every b-r-e-a-t-h—
Will the whir of your cine startle the little fawn who's drinking at that quiet little pool?

NO! All's safe . . . and there's another priceless bit for the screen when this glorious vacation's a memory.

You're under cover, too, in this "movie" game if you're not a member of the association of amateurs . . . if you're not reading the amateurs' magazine.

AMATEUR CINEMA LEAGUE INC.
and
MOVIE MAKERS MAGAZINE

105 West 40th Street
New York, N. Y.

Write for League data and a free copy of **MOVIE MAKERS**

Photographic DEPARTMENT

"It is an unfortunate but common fact," says Charles M. Smyth, writing in the June issue of *American Photography,* "that photographers in searching for beautiful photographs overlook those beauties to be found in the clouds. Indeed, there are photographic possibilities in clouded skies for either amateur or professional that can be equaled nowhere else."

This is the time of year for the photographic enthusiast to look above him for subjects. Mr. Smyth asserts that there is nothing difficult about getting the lights and shadows of the sky on the plate and that methods of exposure and development are the same as in any other class of photography. He recommends a filter which is not necessarily strong, and, personally, uses a Wratten K3 stained gelatine filter cut round with scissors and fitted into the front of a Dagor lens.

"For pictures which I took with the clouds between the sun and the camera," Mr. Smyth says, "I used a speed of one one-hundredth of a second, while for those in reflected light, with the sun at one side or overhead, I slowed down to a seventy-fifth of a second, usually with the diaphragm wide open."

Mr. Smyth recommends afternoon or evening as the time to take these pictures and finds particular delight in thunder clouds with the sun shining on all or parts of them. He says that better results are obtained on a double-coated Orthonon plate.

* * *

Next to a toothbrush, the camera will be the most important item in the equipment of the members of the Nature Magazine Glacier Park Tours in July and August. Several members of the party are carrying movie cameras to record the wild life and scenery of the park and still cameras are an essential item.

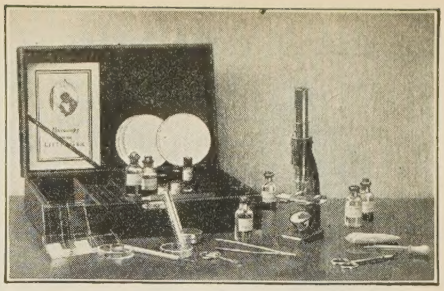
The Eastman Kodak Company has announced a new cine-kodak, Model BB with an fl. 9 or f.3.5. equipment. This is the last word in the group of amateur movie cameras produced by the Eastman Kodak Company. It has a variety of features, among which is that of exterior color scheme.

* * *

With the announcement of the Q. R. S.-De Vry projector, hand-operated, at a price under forty dollars, a usable and practical projector is available for those who feel that they cannot invest in the more expensive machines. This machine gives excellent projection results.

* * *

Of particular interest to users of the Bell and Howell Filmo projector who employ it for business purposes is the announcement of the perfection of an attachment permitting the continuous showing of the film. Previous experiments along this line had resulted in development of attachment requiring skilled service, but the tests made of the new device show that films have passed through the mechanism from five to ten thousand times without mishap or scratch.



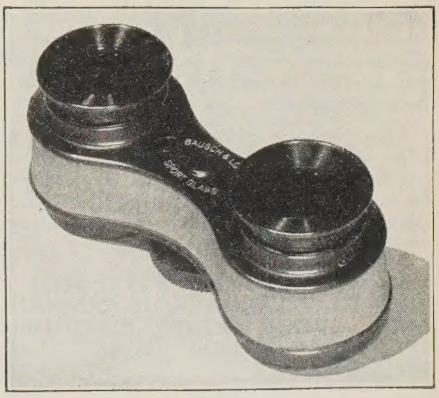
The Little Gem Science Kit

MAGIC AIDS
for eager youthful eyes

A real microscope that magnifies 5625 areas! Clearly shows many things that you cannot even *see* with the naked eye—yet anyone can easily learn to use it. The Little Gem Microscope is a thoroughly practical model—ideal for children, powerful enough for any grown-up amateur nature student. It reveals many wonderful facts that lie hidden in the seemingly ordinary things about you. Interesting—educational—entertaining.

And the Sport Glass places a finely-finished, high-grade glass within the reach of anybody's pocket-book. It is small and trim. It is wonderfully steady and brings distant objects closer. For outdoor games and sports of every kind, the Sport Glass is immensely useful in helping you to follow every motion of the players. It provides endless entertainment for children interested in bird or animal life.

The Sport Glass comes in a variety of handsome finishes at $16.50 to $25.00. Gem Science Kit, complete, costs $27.50. Little Gem Microscope, only, $17.00. Both obtainable at good shops everywhere.



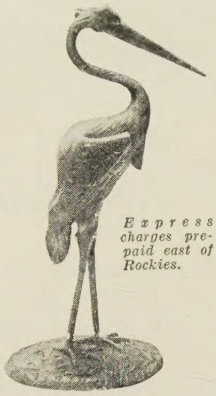
The Sport Glass

BAUSCH & LOMB OPTICAL CO.

728 St. Paul Street, Rochester, N. Y.

For Your Garden

These quaint, lifelike figures, cast of lead, will add just the touch to your garden or pool to give it individualistic charm and distinction.



"BOY AND TURTLE"
Height 18½"
$40.00

"STORK"
Height 21¾"
$22.50

Express charges prepaid east of Rockies.

THE DAYTON MFG. CO.
DAYTON, OHIO

The Out-Of-Doors Is Calling You!

Get a Carpenter Tent and camping equipment; tune up your car and answer the call—take the whole family along. Send for catalog and get the whole story. It's FREE! Contains a splendid chapter on auto camping.

Ask for Catalog No. 601

GEO·B·CARPENTER & CO.

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More Nocturnal Rainbows

In the June issue we carried a note about a moonlight rainbow observed in Arizona and this experience is matched by Irma Van Gorder of San Diego, California, who writes of one observed in that city about four years ago.

"It had been raining", she says, "and the sky was overcast with dark, heavy clouds. I stepped outdoors to observe the condition of the weather and breathe the rain-washed air. Just at that time there was a momentary break in the clouds, and the full moon shone through with almost dazzling brilliancy. Arched against the dark clouds in the west was a most lovely rainbow. Never having seen such a thing before, I could hardly believe my eyes. The colors were not, of course, so vivid as those of rainbows appearing in daylight; nevertheless they were quite pronounced. In a few moments the clouds again covered the moon and the rainbow was gone."

Then comes Mr. John Racer of New York and goes the others one rainbow better. He tells of a double bow seen at night by the crew and passengers of a ship ten days out of Havre in November, 1925. Mr. Racer writes as follows:

"The *S. S. Vincent,* a turbine freighter, had passed the Newfoundland Banks the night before; the weather had been unusually beautiful for that time of the year, but then a squall struck the ship unexpectedly, while the captain and the two only passengers were at dinner, bringing havoc to the soup, the waterbottles and our laps. It did not last long, but the time it lasted, it played us some most humorous tricks. By 9 p. m. all was calm again; next day however it rained occasionally; in the evening it cleared and the moon came out.

"Between 10 and 11 p. m. I was ready to retire and call it a day, when suddenly the only other passenger aboard knocked at my cabin and requested me to come at once on deck to see a rainbow at night.

"'A rainbow at night?' I repeated in doubt, 'What's this? I've never heard of such a thing! Is this a joke?'

"'No', he assured me, 'come at once!'

"I redressed in haste and followed him on deck, where I found the captain and several of the officers, discussing the phenomenon, and later we saw the crew make similar observations from their quarters. Our course was S. W.; the moon was full or nearly so and stood high in the south, with clouds in the distance; north and east heavy rain-clouds made a background to the scenery, where it must have been raining. Almost immediately after our arrival, a second bow began to appear.

"'You fellows are fortunate!' exclaimed the captain, 'Forty years I've sailed the seven seas, and I've never seen a *single* bow at night; and here ("you landlubbers," I thought in the pause), you get sight of a phenomenon that not one in a million men ever sees. This is one of the most unique phenomena of my life.' All of us were of course delighted at his remarks.

"I have seen double rainbows a few times, the most remarkable being two full bows at 4 p. m. in July or August a couple of years before at St. Germain-en-Laye (France) from the terrace, overlooking the Seine valley, with which I compared my present impressions. There it was beauty, grandeur, color with a brilliant shining

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sun, with rumble and thunder, with lightning and pouring rain. Here it was awe-inspiring; with no rumble, no thunder, no lightning . . . silence . . . only the beating cadence of the waves, the song of the wind, with the second bow almost complete. The colors were a little deeper than in day time and very distinct. It was mysterious, one felt awed, I was staring round eyed. 'Thus looked primitive man upon God's manifestations!'

"We had full benefit and enjoyment from the spectacle, for it lasted fairly long, from twenty to thirty minutes. Then the wind came up, the moon gradually was covered with raincloud and soon all was lost in the storm."

A Wise Bird

Man became man, and ceased being a brother to the wild animals after some bright member of the stock observed that sparks were struck when hard objects hit together, and that fire was a useful thing. Or perhaps the evolutionary step took place when another individual, far ahead of his fellows, realized that the thumb and finger combination could be used for holding tools. It has always been a small number of geniuses who have led the way up from the protozoa. And when one observes other creatures doing the unusual, one wonders if the evolutionary process is not still going on. The unusual actions of a flock of tree sparrows, as seen by S. Harmsted Chubb of the American Museum of Natural History, raises the question. Mr. Chubb writes:

"As we sat at the window watching the fascinating and sprightly activities of a flock of tree sparrows, Mrs. Chubb called my attention to one which seemed to be deliberately shaking weed-tops to dislodge seeds and then proceeding to gather up the crop from the threshing-floor below.

"We watched them as long as they were in sight and saw the performance enacted repeatedly. One perched on a curved weed-cluster, the tip of which was loosely held in the light snow, and shook it so vigorously that the end of the weed was freed with a slight jerk, scattering a little shower of seeds which were immediately picked up. Another one flew to an evening primrose between three and four feet high. With a number of quick vibrating movements the dry top was made to shiver vigorously several times. Without even attempting to pick any seeds from the pods he dropped to the snow and picked up the proceeds of his labor.

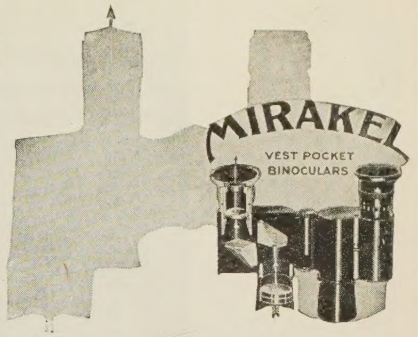
"It was noticed that whenever this method was used there was no attempt to gather seeds directly from the plants.

"It does not seem quite inconceivable that a bright and professional scratcher, such as the tree sparrow, might in the course of his evolution learn to transfer a modified scratch from the ground to the weed-top but that he should, without hesitation, drop to the snow to reap the profits of his discovery is even more surprising.

"How interesting to look back into the dim past, before the hairy cave man learned the use of fire, and then picture an Isaac Newton of the sparrows.

"Or possibly it was the herring gull with the well-established habit of dropping his clams from a height to the hard rocks below who first learned something of the laws of gravity."

Which Will You Take:



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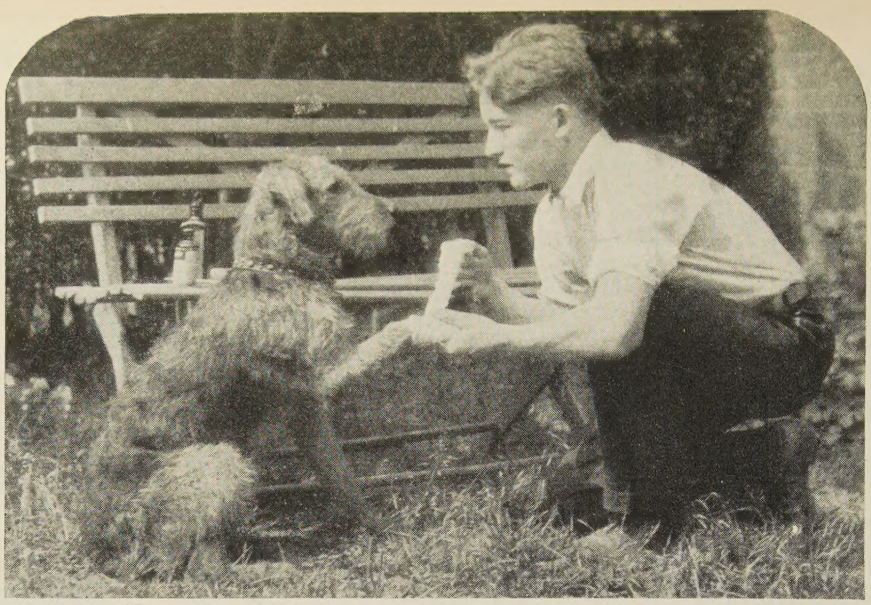

M. ARMSTRONG ROBERTS

DOG DAYS

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TABLE OF CONTENTS

August, 1929

NATURE CALENDAR	*E. Laurence Palmer*	73
BUCK MEETS NANNETTE	*W. L. and Irene Finley*	75
WHEN DEAD WOOD BLOOMS	*G. G. Nearing*	79
THE BOOMING WHALE	*David Starr Jordan*	80
A BIRD IN THE BUSH	*Raymond B. Cowles*	83
THE SONG OF THE FLAG SQUIRREL	*Vernon Bailey*	86
MUM'S THE WORD	*Albert A. Hansen*	87
NATIONAL FLOWER VOTE		91
DEBUNKING THE CALENDAR	*E. Laurence Palmer*	92
A STRANGER CALLS AT YOSEMITE	*Enid Michael*	97
HUNTING A FRIEND	*W. M. Rosen*	98
TREES AND MEN	*Maurice Frink*	99
SAVING TROUBLE	*W. J. Edmunds, Jr.*	102
CRABBING WITH THE COLONEL	*Edward G. Reinhard*	103
THE POSE THAT WARNS	*Gayle Pickwell*	107
THE STRIKING OF THE RATTLESNAKE	*Doris M. Cochran*	108
SPLIT ROCK PALISADES	*Carol H. Woodward*	109
ALBINO GRAY SQUIRRELS	*O. M. Schantz*	111
SANDINO, A NICARAGUAN PET	*Lewis W. Walker*	112
HOW DID THEY GET THAT WAY	*Isabel M. Lewis*	114
THE OAK	*Edward A. Preble*	116
MENTZELIA	*Harvey E. Stork*	117
"NUNAS" AND "NOONAS"	*Leslie L. Haskin*	119
INDEX TO ADVERTISERS		128

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NATURE CALENDAR

AUGUST

by E. Laurence Palmer

AUGUST is a great month in which to enjoy out-of-doors. The mosquitoes that made July a nightmare and the black flies that kept seeking our blood in June seem to have declared a truce. This means that we can leave our tents if we are camping and sleep under the open sky without even mosquito netting between us and the distant stars. The insects that call to us or to their kind lack the persistent hum of the mosquito and take on an equally constant rhythm that sends us off to sleep.

Should we choose to rest outside about August 11 we may expect to enjoy a goodly bunch of shooting stars which seem to radiate from the direction of the constellation Perseus. Accordingly they are called the Perseids.

While studying the planets and stars this August it may be interesting to remember that sixty-five years ago this month Sir William Huggins definitely demonstrated for the first time that there were true nebulae in the firmament. He used a spectroscope in doing this and greatly strengthened the since exploded nebular hypothesis explaining cosmic evolution.

Mosquitoes may be associated with the history which has been made in August since it was on August 20, 1897 that Sir Ronald Ross first traced the parasite of malaria in two large, dapple-winged mosquitoes which he had bred and had fed on an infected patient. This discovery gave him the clue which did so much to open up great areas of country for residence purposes and for development. Seven years later General Gorgas began to use this information to make the Panama Canal Zone a safe place for a white man to live in. In the meantime another mosquito had been found to be responsible for the spread of yellow fever which had killed approximately seventy-five percent of the white employees who had worked on the Canal Zone for nine years under the French. It is interesting to note that the Canal was opened for shipping in August, 1914, just seventeen years after Ross made his discovery. Men have acted much more slowly than this before using many of the equally valuable discoveries that have been made by scientists.

We go to the great open places in August for fresh air. It is interesting to remember that oxygen was first discovered when Priestley was amusing himself in August, 1774, to see what effect heat had upon various substances. He found that the gas that was given off from the heated oxide of mercury greatly invigorated a candle flame and exhilarated himself and a mouse when they breathed it. The gas he called "pure air" but it was really oxygen.

No matter how well we may enjoy hearing and seeing song birds from the comfort of theatre chairs *à la* movietone there will always be lacking the thrill which goes with discovering a thing for oneself on a trip in the field. The theatre may supply us with the nervous fatigue but it cannot give us the benefit of well exercised muscles. We can't thrill because of inspiration supplied by a few square feet of screen as much as we can from lying on our backs in the dark and looking at a whole sky sprinkled with stars any one of which is an enigma. Possibly while we are studying the sky our attention is called to the activities of a deer mouse investigating the possibilities of removing some of our food supplies near at hand while we are supposed to be asleep. On the other hand a skunk or a porcupine may fuss around making as much noise as animals considerably larger, bold because realizing that they are amply protected from interference. Our interest in the skunk may move on to interest in what he is eating. Possibly it may be potato beetles if we are near cultivated ground, or it may be a nest of mice if we are in a wilder place. We may shift our interest to attempting to identify trees as they appear in silhouettes against the lighter sky. If we are still awake and interested we may reach over and pick a weed in the dark, running our fingers over it to see if we can recognize it from its shape, its smoothness or the way it is put together. There are hundreds of ways of enjoying August nights before seeking repose.

DAUGHTER OF A RACE WHOSE CRADLE WAS THE ICY SLOPES OF GLACIERS AND WHOSE PLAYGROUNDS ARE THE SHEER CLIFFS

NATURE MAGAZINE

Volume 14
Number 2

August, 1929

SON OF THE SAND AND THE SAGE OF THE SEMI-DESERT

HIS EVERY MOVE WAS THAT OF GRACE AND BEAUTY

BUCK meets NANNETTE

A Son of the Sand and Sage and a Lady of the Peaks

by William L. and Irene Finley

Photographs by the Authors

"NO ANIMAL except a dog can ride as baggage." The baggage-man pointed to the line in the regulation book and shook his head. "Sorry, boss, but that's what the rules say."

"But this *is* a dog," insisted Campbell Church, "and I want her checked from here straight through to Portland."

"Don't look like any dog I ever saw," the baggage-man demurred, peering through the crate in which Nannette lay, evidently much disgusted with the whole argument. "What kind of a hound is it?"

BUCK AND NANNETTE WERE SOON GOOD FRIENDS

The Finley home they accepted and enjoyed

"That's no hound, brother", said Church, in friendly desperation. "That's a female albino wire-haired Chinese Chow Mein dog found only in the isolated villages of the upper Himalayas. I've just returned from there."

"Oh," said the baggage-man, reaching for a baggage check, "that's different. Hey, Jimmy," he shouted, awefully, to his assistant, "come here and look at this fancy foreign flea hotel."

So Nannette received official status and got her clearance papers and not long after landed at our door. Off came the slats on her cage and forth stepped Nannette, no oriental canine but a coy little mountain goat from the mountains of northern British Columbia.

Nannette looked solemnly from one to another. All humans! Then she saw Buck, graceful and bold young antelope who, not long before, had come from the sand and sage of southwestern Oregon to join our family. Buck, wide-eyed and erect of ear, stared at Nannette, so, just as a friendly and introductory gesture, she bowed her head and clipped him amidships.

Nannette, as was Buck, was still on the bottle and soon the pair were at home together, learning to hang closely on the heels of the bearer of the beverage. There was only one bottle and Nannette with her battering-ram build quickly established a claim to first turn at it.

She stood on her hind legs and drank, with a series of humps that always sent the bottle flying if it was not firmly grasped. Next came Buck, dropping on his knees in a prayerful manner according to custom, and lifting his head high for a long drink. Nannette impatiently twiddled her tail and delivered a broadside on his ribs.

From the very first meeting of this desert buck and mountain nanny one surprise followed another. By their legs and deeds anyone might judge them. The fleet-footed animal of the sage, with tooth-pick legs and a coat that felt like tissue paper, was balanced against the squat form of the little steeplejack of the mountains, whose short legs were rapidly acquiring woolen pantaloons, and whose youthful chin was sprouting a beard. The ancestors of both were perhaps the same in pre-historic times, but for ages one had lived in the open level stretches and specialized in speed; the other took to the most rugged parts of the continent, where death hung on lofty cliffs, and made a business of butting and climbing.

Daintiness of form and movement stamped Buck with aristocracy. He had entered a social circle no pronghorn had ever dreamed of. He had a keen sense of leaping and turning in mid-air, prancing across the lawn, lifting his feet in a way that would put a high bred horse to shame. Yet when it came to a nice sense of precision, Nannette brought into play the traditions under which her race was cradled, treading the icy tops of glaciers and leaping accurately from the point of one rock to another.

One day when lunch was served in the cool shade of the front porch, a plate of salad for a moment rested upon a railing. Nannette may have been keenly aware of the praise given Buck as he pranced around the house. For a moment she stood three feet below the balanced dish of mayonnaise and lettuce. Suddenly she took this as a challenge for her ingenuity; she landed with all four rubber-like hoofs in the centre of the dish. The plate was not broken or even upset, so perfect was her poise; it was only the salad that was wrecked.

WHEN THE LUNCH BELL RANG AT JENNINGS LODGE NANNETTE AND BUCK WERE ALWAYS ON HAND

Nannette liked to stand on her hind legs to drink while Buck often would drop on his knees for his meal unless one insisted that he take it standing up

By instinct Buck trained and kept in condition by running. After meals he was accustomed to leap in the air with a sort of side turn, his front feet landing and hind legs swinging off at an angle. The ends of his legs and hoofs were sloped as if to give the impression that he walked on the tips of his toes. When he bounded away he had three different gaits. All his feet hit the ground at once, and he bounced off across the field like a rubber ball. Again he loped, or if showing off he pranced with feet lifted high in the air like a thoroughbred trotting horse. He ran for the pure love of running, around and around in big circles, seemingly never tired.

If a strange dog came near, the hair on Buck's neck stood on end, and his rump patches flared out, like two white rosettes, a signal of danger. He kept a newcomer at a distance. Danger was not a bogie for Nannette to avoid; she met it halfway. The instant a dog approached she faced the enemy with head down, and her warning was as emphatic as if accompanied by a mighty oath. She raised one front foot slowly and slammed it hard on the ground.

Since there were no cliffs to climb Nannette often ascended a pile of wood. Her favorite resort was the chickenyard, where she found a coop with such a steep roof no one but a goat could climb it. The rims of her hoofs were sharp as steel; within this rim was a rubbery sole, so she could walk the roof with endless delight, just as her ancestors had walked inconceivably narrow ledges on the highest peaks of the continent.

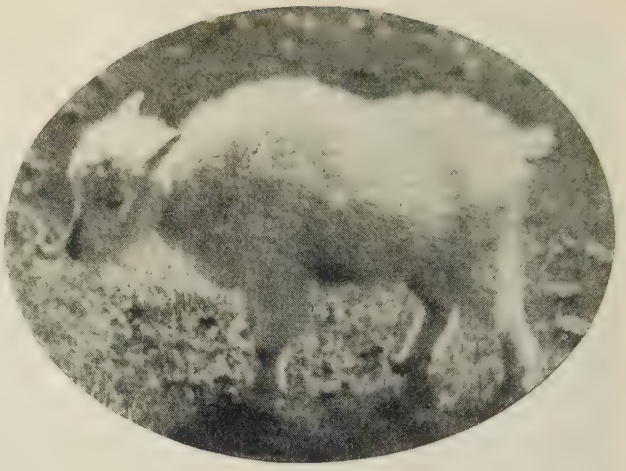
Perhaps the places of birth had most to do with the appearance and character of these two wild pets. Buck always seemed jaunty and optimistic; his ears expressed interest and attention; his big brown eyes were so trust-

NANNETTE IN A PENSIVE MOOD

Dreaming, perhaps, of a glacier or cliff

ful; he liked to push his soft nose into a hand or lick one's face with his black tongue. On the other hand Nannette's appearance was a picture of dejection. Her looks, however, may have been deceptive, for her shyness was likely an indication of a deeper nature. Her head hung low, and as her whiskers lengthened, her cud chewing gave her a more stern masculine appearance. When she tried to play, the best she could do was to rise on her hind legs with a comical awkward movement.

Both Buck and Nannette had been taken out of their natural environment when young. Both craved companionship and while they were attached to each other, they took a strange joy in human kindness. They followed wherever we went; across the fields, down the hill, along the river, through the woods, they were always right at our heels. When we stopped to sit down they both lay down to rest. Buck always scraped away a place with his front foot; perhaps instinct told him there might be cactus thorns in his bed. Then he turned around several times, went down on his knees, leaving his rear quarters high in the air. With a little hump, he folded his legs under very carefully, like the legs of a card table. He never sprawled out because instinct again told him his legs must be folded in position ready to leap off at any indication of danger. No such preparation bothered Nannette. She bent her front legs, put her knees to the ground and fell the rest of the way.



NANNETTE GREW UP RAPIDLY

It was not long before she had grown a set of pantaloons and a beard

In the mountains at home Nannette would have nibbled bits of grasses and flowers where seeds, farflung by the winds, had caught in the niches of rocks. Buck would have taken the slender pickings and the bitter bushes of the desert. In their new home they feasted on lettuce, cabbage, corn and richer foods of the garden; but for dessert they liked the foliage of firs, the acrid leaves of cotoneaster and other shrubbery in the garden. Civilization brought Buck one bad habit.

He was fond of chewing tobacco, a habit he acquired by following our gardener. The fact that he relished cigar stubs led us to believe he missed the

NOT HER MASTER'S VOICE

Nannette's variation of a familiar trademark

flavor of some favorite pungent bush of the desert.

Nannette led Buck to his Waterloo one day when she saw the open door to the living room. She crossed the threshold and when her hoofs struck the smooth hard-wood floor they stayed put. Buck followed but his feet spread in all directions, skidding like a man who steps on a banana peel. He landed upside down, greatly to the amusement of Nannette.

Late in the fall when we were leaving for New York, Buck took his quarters in the state deer park beyond the hospital at Salem, Oregon. At six months he still wanted his bottle of milk. This was furnished by one of the kindly nurses until one day her back was turned and Buck, impatient at the size of his rations, delivered a butt that up-ended his new mother. From that time on his rations were the same as the deer in the park,—plain browse and grass.

A SOULFUL GAZE
Nannette in a calm moment

Nannette has moved across the continent and lives in the New York Zoological Park, where she met a young Billy from the Canadian Rockies. They have a log house under the trees, the most attractive part of which is a plank that leads to the roof. Here one may see Nannette almost any day, perched high on the ridge, looking off and chewing contentedly as if she were gazing down into two thousand feet of cliffs and rocky abutments in the far-away mountains of northern British Columbia.

When Dead Wood Blooms

Regarding the Oyster Mushroom

by G. G. Nearing

A DEAD tree cannot put forth leaves, but it can bloom again. Actually the flower of a hidden fungus, the oyster mushroom grows in decorative profusion on decaying wood.

Hickory trees in particular will burst out with a glory of white petals after a hot damp night, and are sometimes almost completely covered from the root to a height of twenty feet or more. In ordinary weather the mushrooms appear only near the ground and on fallen logs.

Contrary to popular belief, tender mushrooms which grow on wood are much safer to pick than those which spring from the ground. Dangerous fungi nearly always breed in leafmold.

A BEAUTIFUL PARASITE
The oyster mushroom appeals to both palate and the eye. It is not easily mistaken for a dangerous variety

If we were limited to one food mushroom, it should be the oyster, which once learned could not easily be mistaken for any harmful kind. It grows in practically every part of the country, appearing frequently all through the season, which in the vicinity of Washington lasts usually from Easter till the New Year and gives a constant thrill to those that really are sons and followers of Epicurus.

Wherever you see dead trees expect this fungus. It prefers hickory, oak, tulip poplar, maple, beech and willow, but often inhabits other wood. Fenceposts, barn timbers, sawlogs and cordwood if moist will commonly produce it.

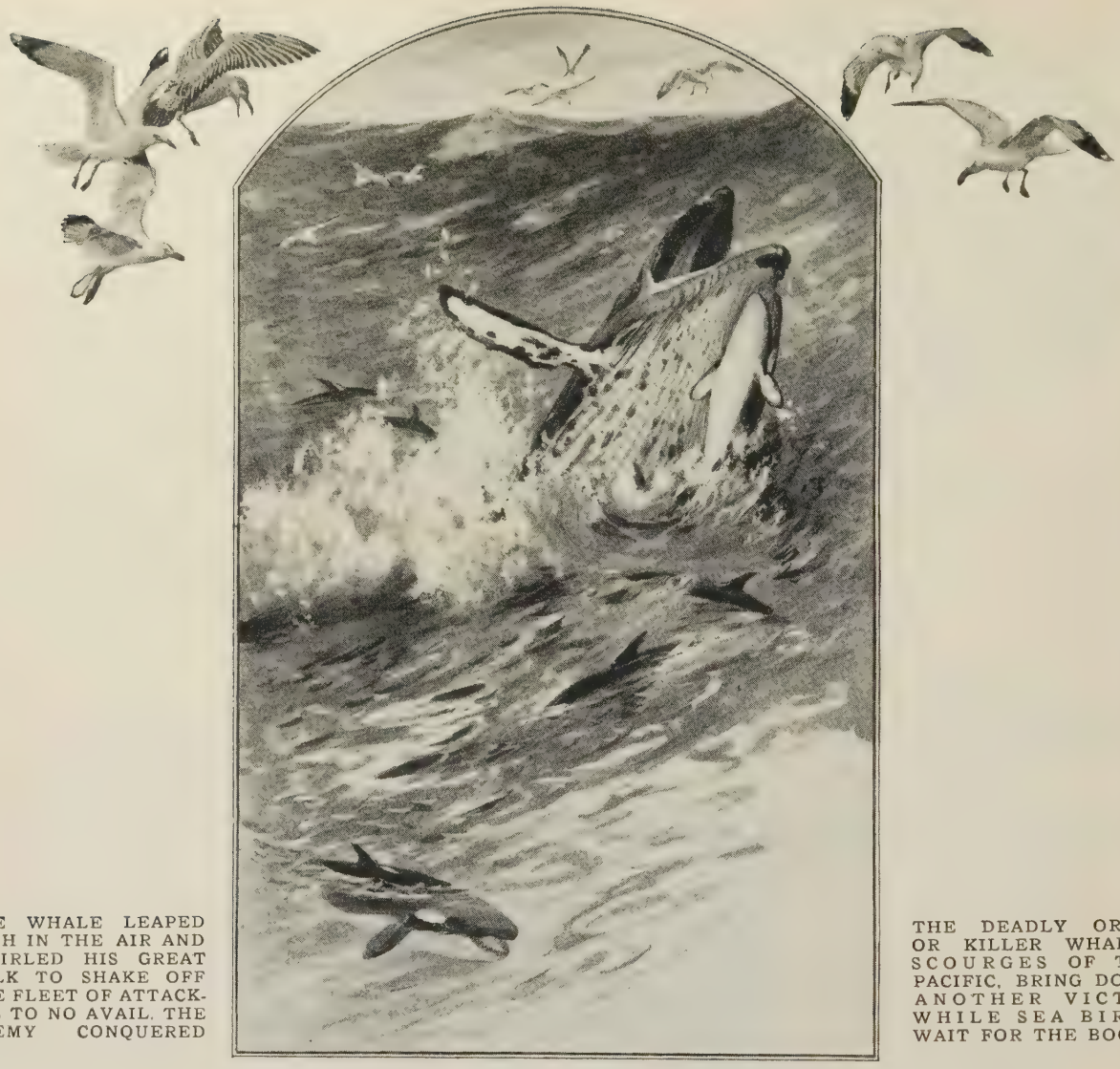
The form is shell-like, irregular and frequently beautiful. Among the hard, corky fungi which frequent tree trunks, it stands out by reason of its tender, food-like texture.

A tree or log often produces crop after crop throughout the season, so that by knowing a few dozen oyster trees, you may depend on finding a mess any damp day. At times bushels wait to be gathered.

After a day or two the soft flesh is usually consumed by worms or by a golden yellow slime. Carefully cut away both wormy and slimy portions before cooking.

Of course it is not wise to gather even safe mushrooms unless you know the species well. Careful study should come first.

The oyster mushroom makes an excellent dish if cooked slowly for a generous time before serving.



THE WHALE LEAPED HIGH IN THE AIR AND WHIRLED HIS GREAT BULK TO SHAKE OFF THE FLEET OF ATTACKERS TO NO AVAIL. THE ENEMY CONQUERED

THE DEADLY ORCAS OR KILLER WHALES, SCOURGES OF THE PACIFIC, BRING DOWN ANOTHER VICTIM WHILE SEA BIRDS WAIT FOR THE BOOTY

THE BOOMING WHALE

His Amorous Antics Give Rise to A Tradition of the Sea

by David Starr Jordan

One by one the ancient and hoary myths of the sea have faded, as science has advanced, and many of the old tales that wrought romance from the deep have been routed from their strongholds of tradition, never to return. The sea-serpents no longer people the seven seas, nor do great fish swallow prophets in the manner of years ago. But one legend **has** existed among fishermen for centuries, and never been downed completely—the belief that the whale is often attacked in the open sea by the cooperation of the swordfish and the thresher shark. The swordfish as is supposed "pricketh him from below", while the slender thresher fastens its teeth in the skin of the great mammal and uses its very long tail, which is almost as long as the rest of its body, as a flail to hammer the wounded beast to death. And even today, seamen cherish the belief.

And though it is certain that no such interspecific cooperation can exist, and that both animals can prove an alibi, still come reports of these allied attacks upon whales. The thresher, *Alopias,* is a relatively sluggish creature with rather small teeth, incapable in force and disposition for any such concerted action. The swordfish, *Xiphias,* swims about all alone, asking no cooperation. It may use its powerful sword to thresh about among sardines and other small fishes, but it has no teeth and could not bite through the whale's thick skin.

Yet it is quite possible to see how these two creatures could be mistaken for others of the whale's enemies. Once off the coast of Lower California I saw a great creature rise out of the water and whirl over and over,

apparently to get rid of tormenting objects of large size which were clinging to it. It was not easy, at my distance, to interpret the action, but my conclusion was that the whale was attacked by a school of the great killers or "orcas", known as *Orcinus rectipinna.* These are dolphin or porpoise-like mammals with strong jaws and teeth, a high dorsal fin and a tiger-like disposition. They have been frequently known to bite off the hind parts of a sea lion, fur seal or porpoise, and their fiendish characters are well known. Perhaps it has been they who unconsciously libelled the thresher shark and the swordfish.

Another fracas of a similar kind was observed by W. W. Richards, a photographer, off Santa Cruz, California. By good fortune, he had a camera with him and took an excellent picture, which shows a rather small whale, perhaps a California gray whale, *Rhachianectes glaucus,* "a cunning, courageous and vicious beast", attacked by a group of twenty or more killers, and leaping out of the water in agony. The high dorsal fins of the killers are very clearly shown. Surrounding the fighting whale is a vast flock of shearwaters or whale birds, *Puffinus,* eager for blood and for their share of the spoils or wreckage. But even this visual testimony revealed no trace of the two sea creatures accused of anti-leviathan conspiracy.

Science, to explode a myth, must always give a logical and satisfactory explanation, however, and when H. G. Fenton of Clarksdale, Mississippi, wrote of his experience in the ocean off Nome, Alaska, in 1896, the time-honored tradition of the sea appeared about to establish itself on a firm foundation. This was before any one thought of the booming whale.

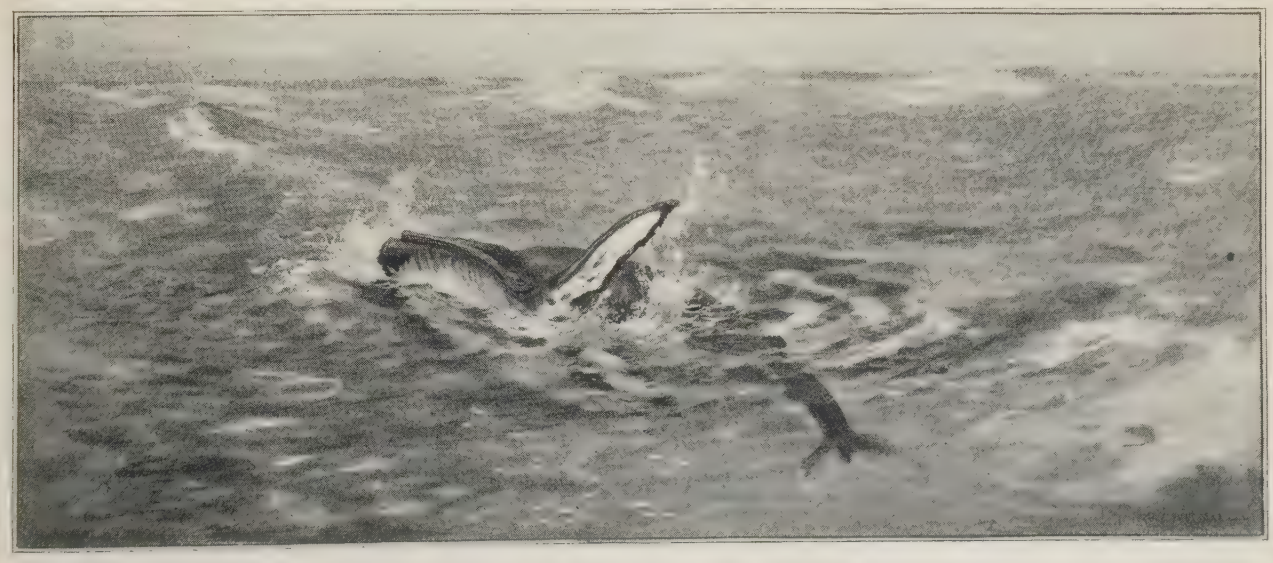
Mr. Fenton, an officer on a government boat, the *Oliver Wolcott,* witnessed, with others, a scene of terrific ocean carnage which he interpreted to be the battle of "a school of threshers and other sharks or mammals with similar tails, whipping a whale to death." He writes:

"We heard the sound of the engagement long before we saw the whale and sharks, and in addition to hearing the blows, we also saw them delivered by hundreds. It was no small affair. Each shark would rise to the surface, projecting his nose a foot or two, then duck his head down and throw the long upper fluke of his tail upward until it was nearly vertical and standing some ten or more feet above water. He would hesitate for an instant, then roll sideways towards the whale so that the tail would hit clear across the top of the whale.

"We were close enough to the whale to see the eyes of the sharks, but due to a moderate amount of small waves, the visibility was not quite so good at the water-line of the whale, and although we saw much churning up of the water, especially under the whale's throat, and the fins and noses appearing, still I have no adequate picture of any exact details of the sharks or killers, if any, other than the feature of the tremendously long flukes of the tails. This was the outstanding feature of the affair, by long odds. There is no doubting the fact of the blows being delivered as I describe as we were within a few hundred feet of the whale for some time.

"Another feature was that as the blows being delivered from both sides, there was not the least doubt of their not being caused by any movement of the whale. Neither were the sharks hanging on to the whale while delivering their blows. They were swimming at all times. They did not stop at any time while we were near enough to hear the blows which continued long after we had again put about on our course. The continuous blows were, as I said before, very like a cannonade. Could you imagine the sounds of the action which you observed between killers and a whale fooling the entire officers and crew of a Government vessel, causing them to wonder if the affair was a sure enough sound of cannons? Not a man on board had any least suspicion of the noise which we heard being caused by other than humans firing guns, until we caught sight of the whale."

I made the suggestion to Mr. Fenton that it may have possibly been the great nurse shark of the Arctics, *Somniosus macrocephalus,* a clumsy, greedy individual known to attack whales as well as to feed on the refuse of canneries. The thresher, I explained, had never been found north of Oregon; the swordfish is a tropical and semi-tropical animal, not seen north of Point Conception. Each of these two could prove their pres-



THE BOOMING WHALE'S LOVE ANTICS
He strikes his flippers against his sides, the blows resounding like a heavy cannonade

ence elsewhere at the time of the naval conflict. And indeed, the nurse shark, the only one in the Arctic waters big enough and greedy enough to make such an attack, has no great length or power of tail.

Perhaps, after all, it was the nurse shark, Mr. Fenton agreed. "I have been trying to visualize the tail of the great nurse shark, if extended up into the air vertically, and believe that it might possibly fill the bill, if the sharks were all large specimens. Of course there was no one on board the revenue cutter, *Oliver Wolcott,* able to recognize the kind of shark which we were observing with scientific accuracy. There is no question, however, of the fact that we saw some kind of shark using very long tails to thrash the whale with, and they were using them with an accuracy and method that precluded it being a chance affair. The sharks knew just how to use those tails to advantage and they all used them in exactly the same way.

"If the thresher is out of the question and the tails of the great nurse sharks not long enough to meet requirements, then I would have no hesitation in saying that there must be still another kind of shark up there.

"The most interesting feature was that each shark would pitch forward in the water, pause with his tail in a vertical position, the upper fluke out of water and the lower at least partially submerged, and then strike from this vertical position across the whale's back. One would anticipate that they would have struck from a low position away from the whale through a semicircle. The latter was not the case. All the blows started from a vertical position. Each shark would hit one blow and dive, another following at once and hitting in almost the same spot each time.

"We watched the astonishing sight for some little time, and then turned back on our course again. The older sailors had all heard of such occurrences, but not a man on board had ever seen such an attack before, not even the pilot, for thirty-five years a seaman."

The facts Mr. Fenton presents, supported by his own and others' testimony, are not disputable, and it is merely a question of interpretation. It was not until the recent return of Dr. Charles H. Gilbert from his salmon studies in Bering Sea where he spent some five years in the interest of the Bureau of Fisheries, that the mystery was solved. He had seen several such episodes, and had a full explanation to make.

And instead of a terrific battle to the death between three species of sea creatures, which every one thought he saw, there were, it is believed, but the playful love antics of an amorous whale! Instead of a great tragic finale that ushered in death, the scenes which for centuries have been interpreted as vicious naval engagements have been but gentle preludes to the act of bringing forth new life!

Where the killers have not been seen, the heavy cannonading and chaotic struggle is undoubtedly caused by one or two creatures, a whale either alone or accompanied by its mate. The whale is the humpback, *Megaptera longimana,* a huge species some seventy-five feet in length. Its large arms or pectoral fins are ten to fifteen feet long, and the animal gives itself violent slaps on the sides with these arms. The blows resound for miles, and resemble artillery in action. No cause of such unique behavior is certainly known, but as Captain Scammon, one of the ablest authorities on the Pacific whales, has suggested, it probably is a feature of the breeding season.

The humpback is much addicted, according to this author, to breaching, bolting and finning, which vices mean, it should be explained, leaping out of the water, shooting out diagonally, and striking the water with its flukes. During the breeding season *Megaptera* is remarkable for its amorous antics. At such times its caresses are of the most amusing and novel character, and these performances have doubtless given rise to the fabulous tales of the swordfish and thresher attacking whales. When lying side by side of each other, the *Megapteras* frequently administer alternate blows with their long fins, which love-pats may, on a still day, be heard at a distance of miles. They may also be seen to roll about in the water and beat themselves with their long flappers; but this seems to be due to an anxiety to rid themselves of the parasites which infest them.

Professor Harold Heath of Stanford University was a member of the Salmon Investigation Committee, under my direction, in 1903. He reminds me of an incident on this trip.

"I never have heard of sharks attacking any species of whale, but I have seen, on two occasions, whales attacked by the orca ("killer"). Possibly you may recall one of these times—we were on the Alaska Salmon Commission trip and were well into the straits of Georgia. Our attention was attracted by a great commotion in the water and we ran out of our course far enough to see that a humpback was being attacked by two killers, which on occasion could be seen, fastened to the sides of the mouth. Blood discolored the foam, but we steamed north before the combat was settled and victory registered for the sharks.

"Also back in the nineties it was a fairly common occurrence in Monterey Bay for humpbacks to come into the surf zone and roll about. The fishermen believed they were endeavoring to scrape off one species of barnacle, *Coronula reginæ,* which sinks fairly deeply into the skin, and may be a source of irritation. In the same locality and out in various portions of Monterey Bay we could see humpbacks "breach", as the sailors termed it, coming entirely clear of the water and falling with a great splash. Much more often they used to flap their great paddles on the surface of the water, and judging from the wave so produced the sound must have been audible for a long distance, though I have always been too far away to hear it. Here again the fishermen believe that the whale is stunning or actually killing the attached barnacles. It may be connected with the breeding season, though of this I am not certain."

Thus another story which used to regale "landlubbers" and sailors up and down the Pacific coast becomes practically nothing but folklore, the swordfish and the thresher are acquitted of heinous and wanton attack at the bar of Science, and the wily humpback, who so long has fooled the world into pitying his fate rather than understanding his playfulness and his noisemaking, is revealed for what he is.

A BIRD in the BUSH

Umkolwane, the Crested Hornbill, —as Romantic as his Name

by
Raymond B. Cowles

Photographs by the Author

THE CRESTED HORNBILL
He holes his wife up while she broods and moults, and lets himself in for plenty of work, forsooth

THE EARLY summer sun of South Africa's November beat down unmercifully. The trees looked parched and shriveled and in the open glades the air quivered with the heat waves. It had not rained for weeks and yet the western horizon was piled high with massive thunder-heads. The air was humid and oppressive in its stillness, the only sounds were occasional distant growlings from the thunder clouds, and the incessant gasping whistle of the bulbuls. Half a dozen were singing from the darkest and least hot retreats of the bush. Even the river looked hot and somnolent, an irregular streak of burning, burnished silver set between banks of black, stunted thorn-trees and baked brown plain. Sometimes the tinker bird, a tiny yellow and green sprite with scarlet crown, chimed in with an hour of pulsating notes that throbbed rhythmically like the beating of a muffled metal gong. It was noontime on a hot summer day, and summer in Natal is always hot, but though the world often gasps with heat at noon, the heavy-scented and misty dawns are reward enough for the weariness of later hours.

Through all these boiling days there is only one bird that really seems to work, the crested hornbill, or umkolwane. Here is a master in the management of home affairs. Here is a tousled, flopping genius, who, after carefully choosing a suitable hollow tree, waits until his mate has started laying her eggs and then without more ado he shuts her up in the nest, leaving an opening only large enough to admit his beak. Here she is safe. Necessarily she has to stay at home and tend to her own affairs, and cannot wander about in the interests of society, to the neglect of more vital matters.

This inspiration makes his home life quite secure; there can be no desertion and no philandering. She must stay at home whatever she might want to do, but in compensation she is kept safe from raids by any enemy. Even the snakes large enough to injure her find it impossible to enter the nest, and those small enough to squeeze inside and steal the eggs simply make an extra meal for the powerfully-billed mother. As with many well-laid plans their consummation requires a great deal of labor, and if we surmise that it is to keep his wife attendant on his children that the male devised this scheme, he provides himself a great deal more work than he might have had otherwise. True to Nature's dominating urge, however, he has continued to place perpetuation of his race ahead of ease, and is now permanently saddled with the cares of supporting a wife and family.

Once saddled with his duties the umkolwane has found that like Sinbad with the Old Man of the Sea, he cannot get free from them. His mate has played a trick and has become, as might have been expected, the real master, another example of the truth in the sentence, "Blessed are the meek". As soon as she has been safely walled up in the hollow tree the male must work to feed her, and she keeps him on the jump. Not only that, but should he wish to change his habits now, and permit or even urge his wife to do her share, it would be a hopeless task. She has chosen this time,

THE LAST WORD

It appears that this family of three young drongo shrikes are rather peeved with one another

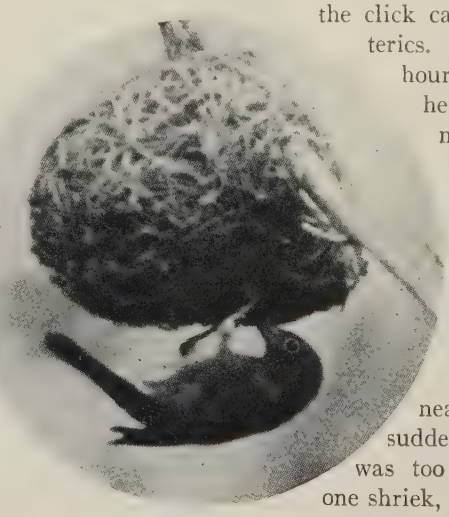
when her mate is frantically working for her support, not only to take life easily and sit comfortably and safely on her eggs, but to moult all her feathers and become helpless. Moulting requires a great deal of energy as does any process involving growth, and this growth may supposedly require more food than would normally be the case. Since the male must supply this food he has virtually been trapped into the job of helping her to moult and not only that, but to dress her up again.

When the female has grown her feathers, and the young are ready to fly, the cement is broken out of the entrance and the occupants of the nest can leave. It is not definitely known, but it is probable that after the nest has been vacated, the entire opening is recemented. This keeps the bees from swarming into that particular tree, an event which would quite probably follow if the nest were not closed. What is definitely known is that the same nest site is used for several years at least.

Owing to the cementing of the nest entrance and the extreme wariness of the male during the breeding season, it is only rarely that a nest can be found, so it was with keen anticipation that a trip was made to a spot where a pair was supposed to be nesting. We found the nest in a hollow tree, the entrance so carefully plastered that sight alone could never locate it, but the characteristic odor was proof enough, so a "blind" was set up and we commenced preparation for photography.

The male was so wary and retiring that it did not seem possible that he could belong to the same species as those frequenting the trees and gardens through the rest of the year. He was so shy that unusual efforts were made to hide the camera which was to take his picture, and the observers' blind was carefully made some distance away and well hidden.

During all the days that followed he was cautious, and when at the nest was especially so. Time and again he would come with food, only to spend an hour or so examining every tree and bush with sharp, suspicious eyes. At first he held the food in the tip of his long bill and sat and watched, then he began to fidget and move from tree to tree, and at last with a toss of his head would swallow the food he had so carefully brought for his mate. For a moment after swallowing he would look about defiantly, then, like a guilty child, wipe his mouth and look about again. His moves when wiping his beak were quick and nervous, and the large red bill when hastily rubbed on the tree branch sounded like a celluloid soap dish rubbed on a comb. When he finally got up courage and approached the nest, it was only by nervous starts and jerks; a final hasty hop and he was clinging to the tree beside the nest and passing in the food. At that moment the camera clicked, and with the click came a fit of hysterics. During all the hours of observation he had been silent, never calling when near the tree, but the sudden sound so close, was too much. He gave one shriek, and flopped away across the glade to sit and shout and scold. Since no enemy appeared, he at length slipped away again, as silent as a shadow.



THE RIVER WEAVER BIRD

Her home is a masterpiece, as she will tell you by her proud voicings

At first his cowardice and watchful waiting was a constant exasperation, but with a little consideration of his case it became obvious that were it not for this unusual care there would be no umkolwanes left. Unlike most other birds who soon find another when their mate is killed, the female hornbill would not be able to obtain another mate to save her; helpless and half naked, she would simply die within her cell, and with her, all the young. The death of the male would inevitably mean that of all the other members of the family. It has only been by extreme caution near the nest that so tame a bird has managed to survive.

The early morning hours were cool, and since no pictures could be made until the light was bright enough, they were simply hours of observation and

FROM THE HILLS FRANCOLIN WERE CALLING
Adding to the medley of sight and sound that mark the African bush

listening. In every bush there is a bird that always brings one to a halt to listen. From far away, like the sounds of returning consciousness, there is a thin steady, bleating call, like the call of a lost kid. At first it sounds as though miles away, then close at hand, then faint again, but finally, with insect-like clicking, a sprightly wren-like bird, as big as one's thumb, and as inconspicuous as olive green can make him, flits across an opening a yard away. This is the *Umbusana*, "little goat", that seems to be everywhere, that is always in every bush riot, and who with cocked-up tail incessantly looks for trouble. The smallest bird in the thicket and the greatest squabble hunter in the bush.

There is more than bird life, however, to break the monotony of long waits. Many times while watching the umkolwane there would come from behind me stealthy rustlings, the swish of a released branch, a sound of dead twigs falling, and I would know that a troop of monkeys was approaching. Usually these were the only sounds to announce their coming, sometimes not even these, simply the thud of an *ingola* fruit as it struck the ground. The foraging band would come stealing along toward the blind, and soon bright black eyes in soot-black faces would be staring intently at the intruder. If no move were made, the advance would continue until all the troop would be feeding in the trees about the hornbill's nest. There was never any sign of fear from the hornbill and no sign of interest on the part of the monkeys, which seemed to prove that both have learned the same lesson in a different way. Monkeys are the greatest thieves and imps of Satan in the bush, and they love young fledglings with an immortal but unholy passion.

The natives, who are very fond of hornbills either in embryo or fledging stage, have found a clever method for keeping track of the development of the young. They long ago noted that many of the little pellets of fruit, seeds, insects and portions of reptiles which the male brings to his incarcerated mate fall to the ground, and the seeds contained in them sprout. When these seedlings are four-leaved, they say, the eggs have been hatched out for two or three weeks, and the time has come for the mother to leave the nest,—and also for the native to lick his lips to enjoy a feast. The natives are less accurate in their common belief, however, that the female is shut up by the male so that after hatching her eggs she may die, and the maggots in her decaying body furnish food for the young. Nothing is farther from the truth.

There are many sounds and sights in the bush. The blending colors, the flickering shadows, and the musical trickle of running water when the world is parched and the open fields are dancing in the heat waves. Early dawn, when perfumes from a rain-drenched bush float on every breeze; evening, when the shadows lengthen on the hills and the heat of day vanishes in a final blaze of hot red light. Then night, when coolness comes and brings with it the fragrance of a thousand flowers too delicate for the heat of day. Aye, Africa is rich in many things which lure the lover of Nature; in scenery and in the attraction that those things still wild have for many. And varied are the things one finds in this bush that teems with life and sound and that draws one to constant study; but amongst all the forms of life that make existence in the bush so fascinating, there is none with stronger personality than that which is owned by the crested hornbill, umkolwane.

OUT ON PROBATION AT LAST
The female hornbill, two young and egg about to hatch. Note mother's new feathers

The Song of the *Flag Squirrel*

The Prairie Farmer's Tenant as a Music Maker

by Vernon Bailey

Chief Field Naturalist, Biological Survey

WE LOVE the birds for their gentle ways, their beautiful plumage, and above all, for the sweet music of their songs, but the birds do not make all the music that appeals to our human ears. We, as mammals, claim some of the world's musicians, and further down the mammalian line are others with pleasing voices well worthy of admission to a chorus of quadrupeds. If some of our ears are too sensitive to enjoy the baritone of a bellowing bull or the Caruso of a roaring lion there are many who delight in the bugling, or, better called, fluting, of the bull elk, the long-drawn wail of the timber wolf, or the falsetto chorus of the coyote.

A THIRTEEN-STRIPED SINGER
When not catching grasshoppers, he fills the prairie with a happy melody

Some of our best mammalian musicians, however, are in the squirrel family. The big hoary marmots or whistlers of the Northwest have a spirited call or prolonged whistle that might almost rank as a song. Some of our tree squirrels have beautiful voices, some soft, some shrill and spirited; but a number of our ground squirrels have the most attractive voices of the family. One that from my youth up has always appealed to me as equalling some of the birds in beauty of voice as well as in colors and pattern is the little thirteen-lined ground squirrel, or flag squirrel, of our central prairie region. Its thirteen buff and brown stripes have suggested the name *flag squirrel* as more than a century ago they suggested to Dr. Samuel Mitchill the Latin name of *tridecemlineatus,* and "flag squirrel" is certainly easier to say than *Citellus tridecemlineatus.*

Out on the flower-dotted prairies you often hear a prolonged bubbling bird-like trill from the grass, and you may listen and wonder for some time before you decide from which direction it comes or how far away it is. If you hunt for it you will probably never find it but if you sit down in the grass and listen you will hear it repeated at half minute intervals, and finally you may see a little striped form standing stake-like in the grass, as curious about your presence as you are about his. If your ears are keen you may hear others, farther away, and in different directions, and if you are not in a hurry and have time to lie on the grass and watch the fleecy clouds sweep across the sky and the shadows and wind waves chase each other over the grassy prairie you will learn that the trills or calls of one are often answered by others; each call is a little different but very similar to the other, some are longer, some shorter; some faster and evidently full of meaning to the little animals scattered out of sight of each other among the tall grasses. Just as the birds answer back and forth in songs, so these little prairie singers keep track of each other by their birdlike calls, and if danger threatens each darts for its nearest burrow with a shrill chatter or frightened shriek that means to all within hearing—"Danger, beware!" Then all music ceases for a time until the coast is clear, and well camouflaged little striped forms begin to push up cautiously among the grass stems, and the same pleasing ventriloquial calls begin again.

In North Dakota I wanted one of these little squirrels for closer study, so taking a spool of thread from my pocket I made a slip noose in one end, laid it over the burrow where one had just gone down, backed off a few rods as I unwound the thread and sat down in the grass. In a couple of minutes a little sharp nose and black eye appeared at the burrow and as the head and neck came higher up I pulled the string and had it tight around his neck. He did not like it nor like to be dropped into a soft cloth bag and put in my pocket, but he was not hurt and not much frightened. In a comfortable box with nest and water and food he was contented for a few days while I tested his taste for different foods. He ate grain and rolled oats and bread and cake when nothing better was offered him, but his preferences were soon learned. First of all he loved grasshoppers, then crusty beetles, and juicy green caterpillars. But grasshoppers were his favorite food. I tried to find out how many he would eat in one day, but never did get enough so he seemed satisfied though I had several boys subsidized to catch them at five cents a bag. With tin can traps and grasshoppers for bait I soon had more squirrels, but that only took more grasshoppers to keep them contented. Apparently all of the flag squirrels of that part of the state were then living almost entirely on grasshoppers, and as it was a grasshopper year when the farmers' crops were suffering severely from these insect pests the squirrels as well as the meadowlarks were doing their bit to make farm life profitable as well as furnishing a cheerful part of the music of the prairies. Though they destroy much grain, they repay in part.

ONE OF THE INTERMEDIATE TYPES OF CHRYSANTHEMUMS

TRUE POMPONS AND ASTER-FLOWERED TYPES INTER-GRADE

MUM'S THE WORD

Chrysanthemums Know a Well-merited International Popularity

by Albert A. Hansen

Purdue University Agricultural Experiment Station

GROWING wild in the Orient are two little daisy-like plants that have been dubbed by botanists with the scientific names *Chrysanthemum indicum* and *Chrysanthemum sinense.* The latter of these has been cultivated for centuries by the Chinese not only for its beauty but also for the tiny florets which yield an intoxicating liquor when distilled or a supposed cure for habitual intemperance when dried and powdered.

WILLIAM TURNERS ON PARADE

The annual "mum" show is becoming a regular event in many cities

Centuries ago an unknown genius crossed these two closely related species and the product proved to be one of the most plastic of plants, yielding in course of time thousands of varieties that range from the gigantic exhibition blossoms of greenhouse culture as large as a human head to tiny blooms the size of a dime; from towsled and fringed varieties to neat little pompons; from the common white and yellow hues to pink and bronze. Although the cross seemed to

(Left) FAMOUS NIO
This is a most popular button pompon for the buttonhole

A GIANT BLOOM
A William Turner measuring 25 inches in circumference

THIS IS CALLED IRMA
One of the attractive decorative varieties

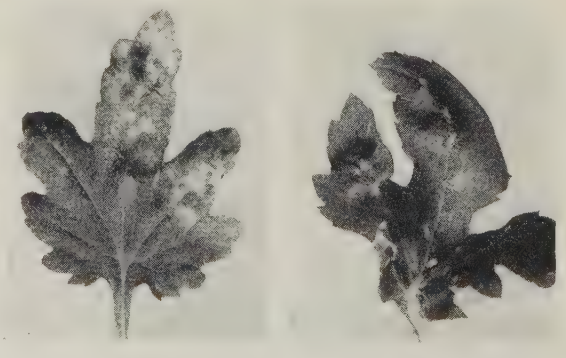
yield to the slightest whim of man, even the most expert of plant breeders have failed to produce either blue or true scarlet blooms. The statement has been made, be it fable or truth, that a blue chrysanthemum has been evolved in Japan, where it is said to be jealously guarded from unholy Occidental hands by Buddhist priests. It has been pictured in the art and mentioned in the literature of the Far East. The advent of a blue chrysanthemum has often been predicted by florists but so has also the arrival of a blue rose, which has never appeared.

Well might the Japanese guard their treasure since the chrysanthemum is the imperial flower of the land of the Tenno. In this kingdom of flowers the chrysanthemum reigns supreme; the ninth month of the Japanese calendar is termed Kiku Dzuki since it is then that the national flower reaches its finest display and the Japanese name for the gorgeous blossom is Kiku. And Kiku receives many other tributes in its oriental home since a favorite name for Japanese maidens is O-Kiku San and one of the highest honors to which a Japanese can aspire is the Imperial Order of the Chrysanthemum.

The beautiful flower was introduced to the western world in 1789 and met with instant favor. Since then the Occident has vied with the Orient in doing homage to what the Japanese term the Queen of Flowers. Throughout Europe, particularly in England, exhibitions of the dazzling greenhouse creations are an annual event in even the smallest of cities and the yearly "mum" show is rapidly becoming a regular event in many American cities.

The remarkable exhibition types of greenhouse mums are produced by carefully removing all flower buds with the exception of a single one at the terminus which receives all the nutrition that the plant is capable of supplying, the product being listed among the largest and finest of flowers. But it is not in these highly trained, pampered pets of greenhouses and conservatories that the average home gardener is interested. To the amateur the appeal of the chrysanthemum lies in the great range of hardy perennial varieties that enliven yards and gardens even after leaves have browned and fallen. So variable is this capricious plant that literally thousands of varieties have been developed either from sports (vegetative variation) or from seed. They bloom late, sometimes after the first flurry of snow, offering a bright touch of color to an otherwise drab autumn landscape.

The hardy outdoor varieties are the usual kinds found in gardens although attempts are frequently made to grow the large-flowered greenhouse or Japanese types outdoors. In the extreme south this can be done successfully but in the north most attempts of this character give unsatisfactory results. This is due in some measure, however, to lack of care, since growers of outdoor plants are usually unwilling to bestow the same amount of attention as with plants occupying expensive indoor space.



SEPTORIA LEAF SPOT AND MIDGE INJURY
Copper lime is used against the spot and the midges are fought with spray or dust by greenhouse owners

There are varieties of

PACIFIC SUPREME
Exhibition flower disbudded for garden use

A FAVORITE *(Right)*
Here is the pompon, prized in old-fashioned gardens

CLUSTER OF MUMS
These are one of the singles varieties, valuable for contrast

mums satisfactory for practically all outdoor conditions except in the extreme north and the arid sections. It is best to select the early flowering varieties in the area north of the Ohio River although even these may require some sort of protection from frost. In selecting colors make certain that they harmonize. For example the yellow, white and brown grown for mass effects, which is the principal value of the mum tribe, blend nicely; but avoid clashing of colors such as may result in trying to grow the yellow and crimson together. Although the word chrysanthemum means "golden flower" when translated from the Greek, the species offers a delightful choice of color ranging from white to yellow, pink, crimson, bronze and purple. In selecting varieties the single-flowered and the anemone types should not be overlooked.

The pompon group vary in flower form from the aster-flowered kinds such as the pink Old Homestead or the bright yellow Excelsior, to the button blossomed varieties, as the bright yellow Mitzi and the brilliant red Pride of Riga. There are all sorts of variations in color from the light pink Elkton and the large flowering white Oconto to velvety red Brune Poitevine and the copper-like Indian Red. Practically all the pompons are hardy, particularly when set in a well drained situation and given a light mulch to carry them through the winter.

It is difficult to select any particular varieties as best from among the hundreds offered, since all have their merits. Study the catalogs and select the type of flower described as to the height, color and time of maturity.

Perennial garden chrysanthemums may be started from seed, cuttings or by means of young plants from the nursery. Seeds are sown in boxes or flats during January or February and the young plants potted for early transplanting out of doors.

Usually the start with chrysanthemums is made from nursery plants which should be set into well-drained soil made rich with manure,—two important points. It is poor policy to economize by purchasing cheap varieties since the better kinds are far more satisfactory in the long run. Chrysanthemums are cheerful plants that enjoy open sunny situations in preference to shade. As soon as the young plants have developed new leaves, pinch off both the tips and the new shoots that appear in order to encourage branching and the

JAPANESE TYPE OF INCURVED MUMS
They are shown above with large irregular type blossoms below

production of a bushy type of growth. Unless this is done your plants may turn into shrubs instead of the small bush-like development desired. This checking of the upright habit of growth may continue until midsummer, when the plants should be given some fertilizer in the form of manure or nitrate of soda, plenty of water, and allowed to do their best to flower early so as not to be caught by frost. A teaspoonful of nitrate of soda per gallon of water per plant applied every other week until bloom is well worth while. The plants that grow so rapidly that they threaten to topple over by their own weight need help in the form of stakes for support, which should be driven sometime during July. For this purpose plaster laths or something fancier in the form of iron stakes may be used to hold them up.

(Above) The sideshoots should be trimmed off so the nutrition will enter the crown bud indicated by the arrow. At the left is the bud which comes three weeks after the top of the plant has been trimmed as at the right, otherwise terminal buds will appear as below

After mid-July the rapid growth takes place until in about a month the premier or crown bud develops. On the small-flowered varieties, particularly the pompons, this is of no particular consequence but where large-flowered varieties are used and huge blooms are desired, the fact that the crown buds usually make the largest blossoms can be utilized to advantage by directing all the nutrition into them. This can be done by trimming off all the short branches that develop in the upper leaf axils. The crown bud and its supporting stem then develop rapidly and a single large flower may thus be produced on each plant. The practice of producing large blossoms in this manner is known as disbudding. On the other hand, if many flowers are desired, do not trim off the shoots but allow them to produce crops of terminal buds which in turn will expand into blossoms. To disbud or not to disbud should be decided by personal preference. It is by disbudding that the huge greenhouse blossoms are produced, one per plant. With the old fashioned pompons it is best to pinch out the buds during the growing season to induce a bunchy growth and numerous blooms rather than to practice disbudding to produce a few large blossoms.

The blooming period of many varieties of garden chrysanthemums is frequently cut short by severe frost, although chrysanthemums may well be considered among the most frost-resistant of garden plants, oftentimes blooming in light snow storms. To protect the blooms against the fingers of Jack Frost, shelters of various types are sometimes built over the bed. Satisfactory shelters may be constructed by placing hotbed sash as a roofing on top of a specially built frame, using burlap, old tent cloth, or similar materials for the sides, but this requires labor and does not add to the beauty of the garden.

When the flowering period is over or the blooms have been spoiled by frost, cut the tops of the plants off and allow the roots to remain undisturbed until spring, when new shoots will appear from the bases of the old stems or from the underground parts. When this happens the plant should be dug up and divided in such a manner that each division contains a young shoot. The divisions are then planted wherever beds are desired, the divisions from the old underground parts being preferred to the ones from the old stem bases. With thorough watering

the divisions are soon started on the road to glorious bloom the following fall.

Mention has been made of the fact that the huge greenhouse mums can be grown successfully outdoors in the south. They may be started from cuttings purchased from a nursery and planted during April in a bed in which well rotted manure has been spaded into the soil. As soon as the plants have gotten a good start pinch out the buds to induce new shoots and decide how many of these shoots should be saved for flowers, counting one blossom per shoot. The fewer the flowers, the larger the final blossoms will be. Stake each plant when about a foot high, fertilize regularly with nitrate of soda from mid-summer until the blooms appear, water thoroughly whenever needed and carefully prune all side shoots that develop in the leaf axils. Also pinch out the premature flower buds that appear during early summer and the true crown buds will develop later, after the first of September.

After flowering the stalks should be cut close to the ground and the roots mulched for winter protection. The young shoots that appear the following spring can be rooted in sand to be transplanted later.

The worst enemies of garden chrysanthemums are aphids or plant lice, thrips and the midge. Aphids may appear on the under surfaces of the leaves at any time and as soon as noted they should be completely routed by spraying thoroughly twice with any of the nicotine or tobacco sprays in accordance with the directions usually furnished with these materials. Dusting with nicotine dust containing not less than two per cent of free nicotine is also effective, particularly if the work is done during early morning hours. Nicotine either as a spray or dust is also valuable against thrips. The midge is the worst enemy of greenhouse plants but is not of great importance to the ordinary home gardener.

Among the fungous diseases that attack chrysanthemums both indoors and out may be noted the septoria leaf spot which is controlled by treating the young plants with copper lime dust.

Some mention should be made of the annual or summer chrysanthemums, sometimes called painted daisies, which are mainly three species entirely distinct from the perennial garden kinds. They are useful in beds, where they are very showy, and for cut flowers. Among the favorite varieties are the W. E. Gladstone with large, velvety-crimson blossoms; Northern Star, possessing large white petals and a dark brown eye bordered with yellow; Eastern Star, which produces primrose colored, brown-eyed blossoms in masses for a long period; Burridgeanum, pure white with brownish red and yellow toward the brown center, and the Double White with lovely double flowers that appear in profusion.

The seeds may be sown in the open during early spring and thinned to a stand about ten inches apart. If preferred, they may be disbudded and pinched back as with perennial chrysanthemums, producing larger flowers. The blossoms appear continuously from June until September although if fall blooming is preferred the seed may be sown during June.

It is interesting to note that the insect powder known as pyrethrum, so frequently used in controlling plant lice and other insects on plants or fruits or against garden insects, is made from the dried florets of *Chrysanthemum cinerariaefolium* and *Chrysanthemum coccineum*. The former species grows wild in Dalmatia and is the source of Dalmatian insect powder, widely used against household pests. The other species is now cultivated in California.

Our common wild daisy is a member of the chrysanthemum group. When the wonderful greenhouse mums are allowed to go to seed and the seeds are planted, single blossoms that much resemble an ordinary daisy are the result. Just another phase of a versatile flower.

Flower Poll Hits Home Stretch

UNLESS concerted action is taken, the wild rose, having garnered nearly half of the total of 675,210 votes cast so far in the American Nature Association National Flower Poll, and having gained a 200,000 ballot lead over the columbine, will be declared the choice of the nation when the referendum ends on December 1 next. The rose leads in all but three states, and in many has rolled up a five to one poll. Supporters of the other candidates, however, are taking solace in the slight gain made by columbine, and predict a heavy fall campaign that will turn the tide.

Pennsylvania, having cast 65,646 ballots, took the lead from Ohio, now second with 60,241, during the month, while Wisconsin is third, with more than 43,000 votes. Still too many states are lagging, and only active work in the fall can give them their proper place in the final choice.

The objection offered to the campaign that the United States is too large a nation to agree on one national flower seems to be without firm foundation in view of the fact that ninety percent of the vote has been distributed among but ten candidates, and the first four are responsible for more than eighty percent. Don't forget your ballot!

The Story Thus Far

Wild rose	329,964
Columbine	132,514
Violet	72,243
Goldenrod	61,751
Phlox	27,416
Am. Beauty Rose	10,333
Daisy	9,732
Dogwood	8,685
Mountain Laurel	7,239

MID JANUARY SNOWS

DEBUNKING the CALENDAR

Will the Thirteen-Month Plan Do It?

by E. Laurence Palmer

Illustrated by R. Bruce Horsfall

NEARLY two hundred years ago, in 1752, when England, following the lead set one hundred years before, instituted by act of Parliament the Gregorian calendar and brought her almanacs up to date with Nature by dropping eleven days out of September, great crowds milled and shrieked around Whitehall and Westminster, crying: "Give us back our eleven days!" Numbers were hurt; and years later thousands died with their conviction unshattered that had the calendar not been changed, their lives would have lasted nearly two weeks longer.

It was at the cost of such great suffering that the last attempt was made to bring the calendar in tune with Nature and life. And now the world may again go through the throes of calendar-making, to replace a system adapted for a leisurely, agricultural and feudal civilization by one timed to the rhythm of modern business and social affairs. Already the conservatives and liberals are lining up their forces—the New pitted against the Old.

THAWS OF FEBRUARY

Nature lovers may perhaps feel they can keep out of the contest which has been precipitated by a little handful of leaders, led by Moses Cotsworth, calendar-maker. What to them are the arguments that there is little relation between weeks and months in the present calendar; that the years are not divided into four equal quarters; that the rotating system of holidays break up weeks in the middle, much to the consternation of both employers and employed? A fig for such bickerings!

After all, however, the calendar is a distinct Nature product, invented primarily for keeping the world in touch with Nature's seasons. Among the Sarsi as among the Mayans, throughout the twelve tribes of Israel as among the roving hordes that swept over Europe fifteen hundred years ago, all systems of noting the passing days were designed to tell when to plant, when to reap, when to hunt, or when to prepare for winter. Whether moonsticks were used, or elaborate markings on wood or stone, or great temple affairs such as Stonehenge in England, the idea was the same among all peoples: Nature and man must keep in step.

EVERY MONTH

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

THE PROPOSED CALENDAR

With the speeding up of the tempo of civilization, falling out of step became more and more disastrous. A failure to plant potatoes at the right time in Ireland might affect the immigration policy and the politics of another great nation hundreds of years later. Crude phenology—observation of the time of recurrent events—became dangerous. Scientists had to measure Nature with unfailing standards, check, recheck, compare season with season, in order to make agriculture a profession rather than a hazard; in order to analyze and understand Nature in all of her aspects.

And so Science created her delicate and powerful instruments—her 100-inch telescopes; her seismographs, her microphotographic equipment; her weather-measuring devices. Given time, she can collect sufficient facts on any Nature problem.

But all facts are relative, and in all the Nature sciences—phenology, meteorology, astronomy, agriculture,—comparisons, however odious they may be across tea-tables, are essentials; one period of a year must be checked with another period; one month against another; one year contrasted with another.

The calendar is the measure which is used for this. And time, as told by the present one, is slightly out of joint.

How can true comparisons be made within a year in which the monthly periods may be of four different lengths, in which February is 10.7% shorter than March, in which the month and the week rarely begin or end together? Oftentimes to look at Nature through the Gregorian calendar is like gazing at a landscape through a piece of wavy glass.

Making perfect calendars is a science in itself. Nature, after all, was rather inconsiderate when she determined the courses of the earth and moon. The day is the natural measure of time, but three hundred and sixty-five and 242/1000ths of them, which represent one course of the earth around the sun, cannot be divided readily. The time for one revolution

"OUT LIKE A LION"

IS Time—or the calendar that measures it—out of joint again? A large group, including scientific and industrial leaders, are emphatic that it is. The League of Nations has adopted this view, and has asked each country to gather data on its calendar for use in an international conference two years from now, at which it hopes to establish a perfect, perpetual system to replace the many divergent ones being used today. Last month, Charles Fitzhugh Talman presented the background of the existent calendar; in this article, E. Laurence Palmer discusses, mainly from a Nature point of view, the pros and cons of the most popular of the suggested international calendars—the 13 month plan of Moses Cotsworth. As America must be a party at the international gathering, and as a committee is already working in this country to bring about a change, the subject becomes more important as time goes on.

APRIL SHOWERS THAT . . . .

of the moon around the sun is not an aliquot part of the year, but is twenty-nine and a half days, a very inconvenient factor. The only variety of week that would fit evenly into the year would be a five day one, and the religious tradition of four thousand years would hardly allow a change from the present seven day week, even if very few rest on Sunday.

Moses Cotsworth, for forty years a fighter for his calendar, and all his life, since the early days as a York-Blue-Coat schoolboy in England and through years as a railway accountant, a student of time-keeping devices old and new, has evolved what many people believe the solution to the entire calendar problem. The League of Nations Advisory and Technical Committee for Communications and Transit have sought him out in their attempt to create a suitable international calendar, and have put his ideas before all nations. In America, numerous societies, including the U. S. Chamber of Commerce, have endorsed his idea, and a number of businesses have already adopted his calendar and put it to practical use.

. . . BRING MAY FLOWERS

His project is to have thirteen months of twenty eight days each in the year. Each month will begin on Sunday, and end on Saturday, causing the same date to fall recurrently on the same day of the week. All holidays will be arbitrarily fixed on Monday, giving two or two and a half day week-ends. One calendar will do for the entire year, unless, of course, the moon phases and almanac data are affixed. The thirteenth month will be introduced between June and July. "Sol" is the name suggested for it. The name "Nature" would be as applicable. At the end of every year, probably the day after December 28, there would be a "Year-Day", an extra holiday, to compensate for the sun's arbitrariness. On leap years another leap-year day would be added to June.

ROSES IN JUNE

Backed by a formidable list of manufacturers, writers, educators, scientists, publishers, and business leaders, the "fixed calendar" idea has rapidly spread. There seems to be little doubt that business would be benefited by such a change. About a billion dollars would be released for circulation by the addition of another month, for the monthly periods during which money is tied up would be shortened. All statistics, now confused by "Hangover" weeks that do not end with the months, and months that do not begin with the weeks, would be put on a scientific basis. Irregularities in lengths of quarters and months would be removed. Time, the most precious factor in world affairs today, would be organized in tune with every other aspect of business.

But even if the arguments of business fail to enthuse the Nature lover, the Cotsworth plan has the charm of lending the same aid to Nature statistics that it does to those of business, according to some authorities. Charles F. Marvin, the chief of the U. S. Weather Bureau, points out: "The simple perpetual thirteenth-month calendar makes it easy to summarize, publish, and scientifically investigate data by units of days, weeks, fortnights, months and seasons, all exact aliquot parts of the year, and all in exact multiple relation to each other." The Department of Commerce agricultural "dope-sheets", the weather bureau reports, the astronomical reports—all Nature data could be figured and issued without recourse to troublesome calendar calibration in tune with the little rhyme of childhood:

"Thirty days hath September,
April, June and November. . . ."

To those bound to cling preciously to their week-ends for the opportunity to be out-of-doors, the new plan offers an advantage over the present single holidays that now amble nonchalantly up and down the week. To a city dweller for whom one day is not sufficient for a real trip, this combination of leisure time will mean new worlds conquered; business, of course, will gain by the more uniform week.

Nor need the Nature lover, of whatever station he is, turn up his nose at the fact that pay-checks will compensate for an equal number of days of work.

1929	AUGUST					1929
SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

COMPARE THIS WITH THE FIXED CALENDAR ON THE OPPOSITE PAGE

Opposition to the plan takes two principal forms. It comes first from the historic-minded, who fear that tradition and history would suffer greatly by arbitrarily placing holidays on Monday, without regard to exact anniversaries. Independence Day would fall on the sixth of Sol, rather than on the fourth of July. Easter would be fixed on April 2, and might lose the significance it now has as it follows the first full moon after the vernal equinox through the winds of March and the rains of April. Washington's Birthday would be celebrated on some day that it was not. Such a calendar, the historians murmur, is a sacrifice of fact to utility, of sentiment to business.

Their arguments would have much greater force, however, if most of the historical dates were not already the result of arbitrary selection, and if the dropping out of eleven days in 1752 had not already confused the records and made shambles of anniversaries. The Declaration of Independence was signed July 2, not July 4, as everyone knows, and Washington, born in 1732, celebrated his early "birthdays" on February 11. Easter does not accurately represent the date of Christ's death on the cross, but the time for it was chosen at the Council of Nice, in 325 A.D., in an attempt to prevent the old Easter, which came in March, from falling on the same day as the Jewish Passover!

Even in the case of important dates in the last two hundred years of history, however, easy tables of calibrations can be created. And as for future historical happenings, one can tell without an argument or a struggle at arithmetic whether future bands of Pilgrims landed on their Plymouth Rock on a Thursday or a Friday. For Thursdays, Fridays and other weekdays throughout the countries will always appear on the same dates within the months.

The second band of stalwarts defending the present calendar are principally those dealing with the records of the past. Some believe that all data collected hitherto —facts from the seven seas and the five continents based on the present months—will be useless. One scientist is even so pessimistic as to believe that all meteorological libraries will have to be scrapped. Without endless computations, he points out, the work of years will be turned into wasted labor. A very real difficulty, though not an insuperable one, concerns those who use records of observation of natural events —the arrival, departure and nesting of birds, the hibernation of insects and mammals, the blooming of flowers, the ripening of fruits. Millions of notes have been published or exist ready for publishing, all dated according to the Gregorian calendar. Thousands of persons

THE NEW MONTH

"Sol" is the proposed name. It will fit in between June and July

are daily using these notes in comparisons relative to particular seasons, in life-history studies and numberless other ways. It is pointed out that every one of these facts, under a new calendar, if the notes were to be of any use, would necessitate conversion of the dates to the equivalent under the new system. The burden of this labor would devolve on those really interested in such studies, and in many cases they object most strenuously to this imposition.

A prominent astronomer, however, is much more optimistic regarding the records of the heavens, which have been kept through thousands of years, under many different types of time yard sticks. He points out that astronomy has given each day of the year a number, known as the Julian number, and this does not agree at all with the days under the present calendar; so there has to be an adjustment, which is made by means of elaborate tables. Under any new system, new tables would merely have to be created, and astronomy would go sailing on much as before, keeping time in its own way. He does not endorse any new plan, however, for he does not believe that it would help his field to any extent; but he is willing to admit that if the system would benefit business or other sciences, the work of adjustment of past dates would not be burdenably increased.

Even the strongest proponents of the new calendar realize that to bring the past and the future into smooth conjunction will be a monumental task. The act of Congress establishing another system must carry tables for the adjustment of dates on bonds, mortgages and notes. To interpret citizenship records, birth certificates, registers of deeds, phenological, agricultural and other data in the light of new time-units will mean years of work.

But just as a scientist will dispense with all his former equipment to adopt some new method bound in the long run to prove more successful, so will the world be willing to undertake great tasks for lasting benefits.

Unless all nations adopt the new calendar, however,

FIRES OF JULY

DOG-GONE HOT IN AUGUST

SEPTEMBER MOULT

WILL IT BE ADDED?

The Fourth of July will fall in this month, assuring its popularity

the stupendous task of adjustment would not be warranted. All the peoples of the earth must be brought together. At present, but slightly more than one-fourth of the population of this planet use the Gregorian system; while by far the greatest portion of the land area is ruled by other types, for which, in the collection of data, allowance must be made. This, in itself, is a gigantic undertaking, and if one universal plan could be followed, adapted for centuries to come, the work adjusting the Old to the New would be quite small.

It is perhaps an indictment of the modern world, with its hurry and exactness, that we cannot run our business on a schedule set by the moon, or, say, on the run of shad up rivers or on the trilling of toads in the waterways. If checks would only arrive with the coming of swallows, or the tragedy of bills be ushered in by the mourning dove, there really would be communion with Nature. And if we needed not a calendar for notice of our seasons, but solely the appearance of bright-eyed bluets, the call of peepers, or the sweet song of the blue-bird on his return—life would flow much more leisurely.

Of course, Nature herself does not care what kind of a schedule it is by which men try to keep track of her. And to many lucky souls, not bothered excessively with world cares, the appearance of bright-eyed bluets, the call of peepers, the forming of new ice, or the singing of taut telephone wires when the temperatures are severely cold are the only signs of the seasons bothered about. Baseball enthusiasts begin practicing in the streets without looking to their calendars to see when they may do so. Boys begin playing marbles without first consulting Moses Cotsworth and lady-bird beetles emerge from hiding in the cracks in our homes with the first warm weather though they couldn't read a calendar if they crawled all over it.

But most of us must be ruled by a calendar—we must watch closely the passings of the days, and count them, measure them, mull them over to see that each brings its quota of progress, and can hold up its head with the rest. Closer and closer the time margin is shaved down until seconds and minutes mean more than hours and days of centuries past. Now we must follow the scientific; the way of the fathers is not enough. We plow when science tells us the frost has left, and harrow when we know that we will turn up insects for the frost to kill. We use Agriculture Department news sheets containing information up to the hour, instead of our grandfather's almanac with its medicine advertisements and its signs of the Zodiac. We use an incubator, to improve on the way our ancestors duped the hen. And since we have fallen away from the old ways in our agriculture activities, so can we learn to do the same in attending to the other affairs of Nature.

The League of Nations has given every nation two years in which to gather material on the calendar, and some time in 1931, an international conference will be held. In the United States, a national committee, headed by George Eastman and Dr. Marvin, is sounding out business and popular opinion and collecting valuable data. It is hoped that the new international system can be adopted on January 1, 1939, because on that day, the year, month, hour, minute and second toe the mark together for their annual race. In other years there are always liberal handicaps.

The Congress of the United States, it is to be hoped, will give the matter its earnest thought, and at least not decide to cling to the Gregorian system without basing its conclusion on sound reason and reflection. It undoubtedly will send representatives to the League meeting, and, if public opinion forces the issue, probably will instruct them to act officially for the nation.

Nature lovers will take a part in either advancing the new idea or in preventing its success. The greatest force in the world—public inertia—lies between Moses Cotsworth's dream and reality.

Over eight hundred years ago, old Omar Khayyam, himself an astronomer and calendar maker as well as philosopher and poet, wrote:

"The moving finger writes, and having writ
Moves on; nor all your piety nor wit
Shall lure it back to cancel half a line,
Nor all your tears wash out a word of it.

The task for the twentieth century seems to be to teach the hand of time to move smoothly and connectedly, rather than in such a confused and halting manner as now with our present calendar plan.

THE HARVEST MOON

FODDER'S SCARCE IN NOVEMBER

WINTER SLEEP

The Hoosier State prefers the Bloom of the Tulip Tree

E. L. CRANDALL

The Native Violet is the State Flower of New Jersey

J. HORACE McFARLAND CO.

The School Children in New York designated the Wild Rose

Delaware has made the Peach Blossom its Flower

The floral representatives of eight more states get together for conference, perhaps to consult about proper tactics in the National Flower Campaign as the vote draws toward its closing days. There is still ample opportunity to choose one as most symbolic of the nation. Each favorite son solicits your vote. C. W. Johnson was the fortunate photographer who snapped most of these notables

The Apple Blossom rules in the State of Michigan

Introducing the Wild Rose of Iowa's Prairies

Minnesota legislators picked the Moccasin Flower

L. W. BROWNELL

Blossoms of the popular Red Haw of Missouri

"HE WEAVED ABOUT THE LAWN, SCARING UP LEAF-HOPPERS AT EVERY STRIDE"

"HE PAID SCANT ATTENTION AS WE PHOTOGRAPHED AND STUDIED FROM ALL ANGLES"

A Stranger Calls At Yosemite

Red Phalarope Pays Respects to the National Park

By Enid Michael

It was a golden day in the golden autumnal month of October when the little stranger from the north dropped into Yosemite Valley to pay us a visit. No doubt he was on his southward flight; perhaps he had traveled far; but in any event, he had managed to develop an appetite, for when we came upon him he was very busy gleaning a breakfast from the lawn in front of the Yosemite Museum, acting perfectly at home.

We rushed out to inspect the visitor. A red phalarope! What was he doing here, this small water bird who nests in the farther north and winters on the open sea somewhere south of the equator?

He didn't seem to be as thrilled with us as we were with him, for he went on scaring showers of leaf-hoppers with every stride, weaving across the lawn on his lobed feet like any other sailor not used to land. But we rushed out with cameras and feverishly jotted down notes—for a new species had paid us a visit!

A new species becomes an event after you have made a daily bird survey for six years, and already listed one hundred and thirty of them. You can't be nonchalant about the hundred and thirty-first, and pass it off lightly, especially in Yosemite, which in itself is a great outdoor aviary. The valley proper is about eight miles long and a mile wide. The sheer cliffs rise three thousand feet on either side, forming a great out-door cage, from which, however, birds are free to come or go. They may follow the river up the winding Merced Canyon into the valley, or may drop in from above. And it does not take long to learn whether a new bird is in the valley, for the unique isolation of Yosemite gives every chance for discovery. And a new creature—well, one blessed by a bird hobby understands.

And so we watched Phalarope, as hour after hour he waddled about the lawn, forever jabbing this way and that as he snapped up the minute morsels of food. Finally after three hours, he paused and looked about, as though he had just remembered an appointment and realized the lateness of the time. Then he lifted his shapely pointed wings and started off uncertainly. Wavering along, he lifted toward the oaks, then flew higher, gaining power, and when last seen he was headed down the valley in strong steady flight.

Open-mouthed, we watched him go. The amazing thing about the bird had been his absolute confidence, his boldness. Was this a young bird who had never before seen a human being and therefore did not recognize his most deadly enemy, or had he a subtle understanding? When we stood on the lawn taking notes the bird walked about our feet. When posing for his picture he was quite unafraid and even the snap of the kodak shutter did not cause him to wince.

Two days after our phalarope adventure we cut across the Sentinel Meadow and as usual approached the Indian water lily pond in hopes of finding some water bird. We were lucky this morning, for there, swimming among the prostrate lily stalks that surfaced the pond with a sort of lattice, was another red phalarope. High and lightly he rode upon the water and worked adroitly up and down the crooked avenues, casting pretty reflections in the pool.

An agile and clever bird upon the water was this phalarope. He swam an eccentric, zig-zag course upon the surface, remindful of the bird we had so recently watched upon the lawn. In this element, however, every

wave, ripple and motion were known to him, and here he was performing with the grace of a fairy. In rhythm to the strokes of his swimming feet there was a slight forward and backward movement of the head in quick time. And there was a second head movement even more pronounced than the first; a continual turning from side to side as the bird made lightning jabs at bits of food. These movements are characteristic of all phalaropes on the water and the careful observer may recognize the birds by these traits, even at a distance.

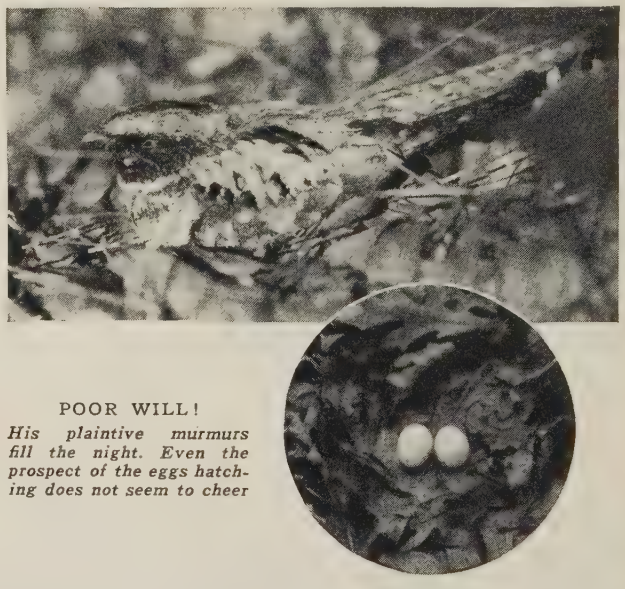
A FAIRY UPON THE WATER
The phalarope knows every ripple and wave, and performs with infinite grace

So here was another proof that lightning may strike twice, red phalaropes landing in the same season in Yosemite, when none had been revealed by the six previous years. There could not have been more delightful visitors, however, nor ones more ready to be photographed and studied. Here's wishing that henceforth these winsome little creatures, so graceful on water and so unsteady on land will continue to make Yosemite one of their ports of call.

HUNTING *a* FRIEND

A Bird Becomes More than Her Call

by W. M. Rosen



POOR WILL!
His plaintive murmurs fill the night. Even the prospect of the eggs hatching does not seem to cheer

THE whippoorwill has always fascinated me. Even when a small lad I listened, half afraid, to its lonesome and weird call. Too many times I had heard the story of poor Will and his fate. When I grew older my awe turned to interest and I longed to see this mysterious bird of the night. Many times at dusk I followed his call but my quest seemed to be as useless as though I were looking for the pot of gold at the foot of the rainbow.

On one of my daily tramps, my ambition was realized when I stumbled upon the hiding place of the bird. It was on a steep, thickly wooded hillside high above the waters of the Des Moines river. The mother whippoorwill was sitting upon the dry oak leaves almost hidden from view by the drooping branches of a nearby tree. The deep shadows made her eyes look like button-holes while her plumage seemed to blend evenly with the leaves upon which she was sitting. Here was a perfect example of Nature's protective coloration. Her mate was sitting in his peculiar fashion. I had always had a desire to see this strange bird sitting lengthwise on a branch. As I stood watching, the female fluttered away in the woods as noiselessly as a butterfly and there upon the ground lay two lilac spotted eggs. She had not bothered to make a nest but instead she used only the forest floor for her home.

When the bird returned I took several photographs of her. The bird remained motionless during all these proceedings and the last picture was snapped at less than three feet from the bird. I flashed a mirror into her dark hiding place to secure a better light. I felt as though I had hypnotized my subject because she only blinked her eyes contentedly as the shutter of the camera clicked again and again.

A few days later I returned to observe my interesting friends. The mother whippoorwill fluttered away with a peculiar "clucking" call and there tumbling around on the dry leaves were two fuzzy creatures, resembling caterpillars. But upon being disturbed the mother bird did not carry away her young, as many ornithologists say the bird does.

I visited this family daily until the young were eight days old. Then they were covered by a thin coat of gray feathers. They could not fly but only hopped around busily among the bushes. Upon the ninth day I failed to find them at home. But I felt satisfied to know that the young had grown up safely and had gone into the world to be useful to man, and to grace the twilight hours. My friend was no longer a mystery.

Trees and Men

They Are Buddies of the Out-of-Doors

by Maurice Frink

AMID GROWING THINGS
What is like camping near great pines, or watching your planted seedlings become a forest?

THREE of us had driven seven hundred miles to go fishing, and had come, at last, upon the home of Battle-Ax Nelson, our guide. Boat, bait and a place to camp were ready, said Battle-Ax as he shook hands. He told us where we were to go, and showed us a map, calling the roll of his lakes as he pointed them out—Carlin and Katinka, Candy lake, Mary lake, and Little Papoose. There were bass in this lake, perch and bluegills in the other, and one was musky water. We helped him load on his truck the boat that we were to use, and we turned our cars toward the road back into the woods, where we were to spend the next ten days.

Tired, hot, hungry, we were, and eager to get to our camping spot. We hurried Battle-Ax all we could. At last he was ready to start. He climbed in his truck ahead of us in the road. Then he climbed out again, and came back toward us.

"'Y gol," said Battle-Ax, "I almost forgot. There's something over here a little piece that I want you to see. Just come over here"—and he was off across the field, in his great woodman's stride without a look back.

I doubt if we concealed our impatience as well as we might have, but Battle-Ax didn't know it, for he was leading us off to the far side of his farm. Through a hayfield he strode, and presently he came to a halt on a level stretch of land.

"There," he said. His deep-set eyes were shining, above the shaggy beard that covered his famous chin, and the tone of his voice was proud. His long arm swept the spreading landscape.

"One thousand of 'em," he said, as we stopped beside him.

"Pines—little white pines! And every one agrowin' good. I've watched 'em all, and they're goin' to make it this time. Cyclone tore my first crop out, four years ago, but I started all over right afterward.

" 'Y gol, you know, I like to see things growin'!"

We saw them then, little white pines, barely high enough to poke their slender tips above the weeds and grass. But they were thriving.

All around us were the shattered stubs of the cut-over land. Wisconsin was timbered off, for the most part, many years ago; gaunt, blackened stumps tell the story, through all the hills and second-growth woodland. Here and there is a patch of virgin timber—sufficient to recall the glory of the past.

And here in the wilderness of Vilas county was a tough old woodsman, most of whose seventy years had been spent at the task of cutting down trees, turning at last to the growing of them and taking joy in it. They covered a good share of Nelson's land.

"I've seen a lot of timber cut, in my time," he said. "I never used to think anything about it, just went around cuttin' 'em down, and cuttin' 'em down. Then after it was too late I saw what was happening.

"I'd put all the trees back that I ever cut down, if I could. But that ain't possible, so I'm growin'

MR. FRINK, *the author of this story, is a newspaperman,—the City Editor of the Elkhart, Indiana,* Daily Truth. *At the same time he is one who loves and understands the out-of-doors. What he has written here are flashes and thoughts on what forests and the outdoors mean to us, or should mean. His article in an informal text on conservation. Enjoyable to read, it leaves one with a thought.*

A SYMBOL OF PURE BEAUTY —NATURE'S MASTERPIECE

IT FORMS THE SETTING IN THE UNWALLED ROOM

these. I'm makin' it up the best I can in this way.

"I'm kinda foolish about it, mebbe, but—'y gol, the older I get, the better I like to see things growin'!"

Well, I like to see things growing, too, and that is why I often think of Battle-Ax Nelson, of Vilas county, Wisconsin, and wish his pine trees well.

* * *

And I used to go fishing with a poet, from Chicago (O yes, there are poets even there), a slender, spectacled man, frail of build but mighty of mind. He used to quit Chicago once in a while, leave the rattle and roar of the city, the rush and whirl of the life he lived there, to go with me to Shavehead Lake. There we would loaf, and talk, and read, and fish. He was no fisherman, yet he loved to fish. He was a city man, a man of the pavements and skyscrapers. But I took him to Shavehead Lake, and he loved it as I did.

There were bugs on the water, one night when we were there—big, flapping bugs dropping upon the water along the reed-rimmed shore. Bass fishermen know what that meant. For the first time since we had been there on that occasion, the bass were rising. They were "breaking" all around the lake, leaping into the dusk to feed on the bugs.

In the poet's hands I placed my choicest fly rod. I told him that perhaps he had never caught bass before, and he might never do so again, but he would catch them tonight. Quietly I rowed him to the point where the bugs, and hence the bass, were thickest, where the fish kept the water asplash with their leaping.

The poet waved my bamboo wand, the line curved out, the fly settled on the water. There was a plunging splash—a strike on the first cast.

But the poet set the trigger on the automatic reel, the line swept in, the leader knot caught the guide tip. The end of the rod snapped off and dangled on the slackened line, hanging limp and useless over the boat edge. Our only rod was broken on this, the bass-fishing night of nights.

So suddenly, instead of being out fishing, we were merely out rowing. And it wasn't such a terrible disaster. In fact, I forget whether we ever did catch any fish on that stay at the lake. It was several years ago, and I am not certain that we even fished any more after that evening.

But I remember the trees, as we saw them that night from our boat on the lake. I remember that on one side of the lake the tamaracks were still touched by the sinking sun, while on the other side they were already in deep shadow. I remember how the shadows lengthened, and deepened, and that presently there was only a rather small center part of the lake that was light; the shore all around was dark, but the tops of the trees stood up and touched the stars that soon silvered the sky.

I had the broken rod repaired, and I use it yet. And I never draw it from its weather-beaten case without remembering that night at Shavehead Lake—the night we might have wasted in fishing, except for the accident that gave us time to see the lake at twilight, and the trees.

* * *

That Michigan county is blessed by a hundred lakes.

A MIGHTY LOGGER OF THE PAST

"Battle-Ax" Nelson spins his yarns of Wisconsin cutting while his beloved forest grows

ON SHAVEHEAD LAKE
The trees line the banks like close-ranked soldiery

But Shavehead is king of them all.

At Shavehead the shores are marshy, hiding snakes; the water plunges deep just off the banks; jagged bluffs tower above the water, or abrupt marl walls rise at the edge of the waves—and there are almost always waves, for the winds are ever on the move at Shavehead. The woods that crown the hills and feather the valleys are shelter for bird and beast; on an afternoon as I trolled for bass there were seven hawks at one time, sailing in sweeping circles high above the lake.

Bear Lake has level picnic grounds, comfortable to lie and doze on while the children play safely under the trees; the beach at Skyhawk Lake is shallow farther out than anyone cares to wade; there is a dance-hall close by the trim cottages that line the well-kept roads of Tamarack.

Shavehead Lake is hard to reach, its roads are rough, its shores are marshy, its fish are fickle. I shall go again to Shavehead! And I mean no disrespect to camping partners—for I have shared my outfit with the best there are—when I say that I shall go alone—at least once each camping season. "To think and be still."

For it is my opinion, born of experience, that days spent alone are, after all, the best of days outdoors. Solitude too greatly prolonged I should not care for; but certain it is that a few days of aloneness add something to life in a tent that impresses indelible memories of sunrise and dusk, of mysterious night sounds, of the softness of blankets spread beneath green rafters. After living by myself in the woods two or three days I do not mind if the flapjacks are failures, if the coffee tastes like coffee or is merely brown water, if the potatoes are raw or burned. I am by that time aware only of the sod and the clouds and the winds, of the little friendly light across the lake as I roll up for sleep with no one there to whom to say good-night.

Through the tent door, or through the mosquito-net canopy over my bed if I am sleeping outside the tent, I can see a scattering of stars. And every time I waken, through the long luxurious night, there are different stars there, in new formations, with changed glitterings. Once, one of them came down and crawled across the gossamer shelter above my head; at least I thought so at

PUBLISHER'S PHOTO SERVICE

AT TWILIGHT
Trees merge into blackness above quiet waters

O. M. POOLE

THE CHARM OF SNOW AND TREES
Each twig becomes a delicate icing, each trunk a silhouette

the time, though perhaps it was only a fire-fly, a true night-errant.

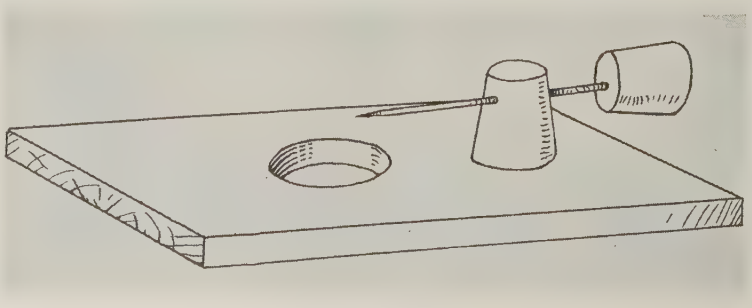
Sleeping alone under the trees at night, or just lying there and sleeping part of the time, and watching the stars, is the surest way I know of to gain back something of the strength and calmness, the peace of mind and the quietude of soul, of which the cities rob us. I remember that last June, on my first camping trip of the season, I lay so; and I remember that some time during the night it seemed to me I was looking up at the sky through the branches of a Christmas tree; the stars in its swaying leaves were the candles on its branches. And the unknowable noises of the dark, the mists that veiled the lake in beauty, the camp-fire smoke in my eyes and the breath of the woods in my lungs,—these, I thought, are the Junetime Christmas gifts waiting on that tree in the unwalled room for all of us who will seek them out.

SAVING TROUBLE

With a Handy Device

by W. J. Edmonds, Jr.

To examine unmounted microscopic objects such as insects, this device will save time and temper. A hole one-half inch in diameter is bored through the center of a slide three inches by one inch, made of some thin wood such as cigar box wood, and near one end, another hole is drilled and countersunk to accommodate a wood screw which secures a small cork to the slide. Through this cork a large darning needle is passed, and on the eye end another small cork can be placed, to serve as a handle. This handle can be held in place by passing a small pin through the eye of the darning needle.



To use the arrangement, just touch the end of the needle with canada balsam or mucilage, and the object will adhere to it. The slide of the device is then placed under the clips on the microscope stage and moved about as necessary to allow examination. A third piece of cork on the tip of the darning needle will help further in some cases.

CRABBING

With the Colonel

Wherein Several Varieties Are Caught

by Edward G. Reinhard

Drawings by Clothilde Marchand

Doc Jellybean, the jovial captain of the crew, had just given orders for the afternoon:

"Bob! Old Webbendorfer wants a dozen *Chaetopterus.*"

"Big boy! Twenty-four *Cummingia* and a pail of *Limulus* for Room 213."

"Stogey! Go with Jim and mop up some starfish from the sound. The *Nereis* is about ready to start."

Doc chewed awhile at his cigar, fat but strong like himself, then turned to me: "Jeff and the Colonel are going to Waquoit after blue crabs. Hop along with them. It'll be a good trip and you'll like it better than squirting formalin juice into lobsters."

It was an August afternoon in the Supply Department of the Marine Biological Laboratory. The collecting crew was being dispatched to gather the zoological material requested by investigators who were carrying on research at this famous laboratory on Cape Cod.

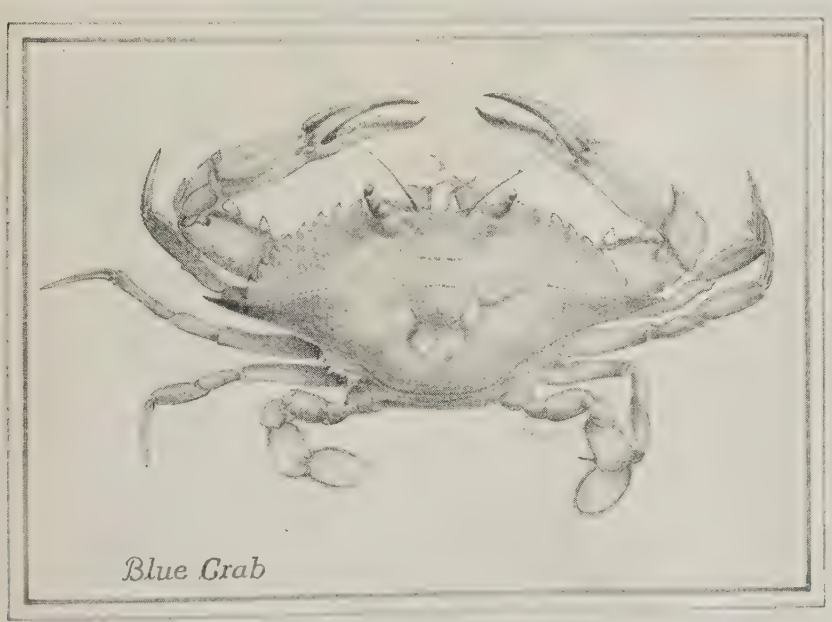
Though not a regular member of the crew, by a lucky chance I had been permitted to join the party during the remainder of my stay at Wood's Hole. To me it was the greatest treat of my young experience.

The opportunity to go afield with that pair of bush-whackers, Jeff and the Colonel, was an event not to be slighted—Jeff, that jolly, impetuous, energetic barbarian; the Colonel, original, picturesque, looking like Neptune and perhaps as old, but with the spirit of a boy. With them I would gladly have gone banshee hunting at midnight in a haunted house alongside a graveyard.

From the very first, the Colonel had caught my boyish fancy. A tall, bewhiskered man he was, with clothes that seemed to have been salvaged from Davy Jones' locker. A white tennis shoe clung to one foot like a huge barnacle; a black leather oxford kept it company on the other. The trousers, fastened with twine, were always at high tide, exposing two brown sea-anemones which presumably were his ankles. A shirt, the color of a dead squid, was protected from further damage by a tight-fitting vest, black as a wharf-pile and all knotty where the pockets bulged. But the face above made one forget and forgive such a beach-comber's costume. It reminded one of Moses, so venerable was it, though a very short-stemmed pipe nestling close among the heavy mustaches, gave the visage an appearance of anachronism.

"Young feller, go and fetch a couple of long-handled nets," ordered the Colonel, "and bring your hip boots."

I hurried to fulfill the order, and was back in a jiffy. Jeff already had the Ford truck loaded with a small flat-bottomed boat and some wooden cannikins.



Blue Crab

Off we started with a rush; the two worthies seated in front, while I sat in the boat to keep it from going overboard. We bumped along wildly like a miner's covered wagon stampeding to a gold rush. Jeff was at the wheel, pressing the accelerator with reckless speed. It was thrilling, so I did not object, but what need was there for such haste?

Waquoit appeared at last, after nearly an hour of fierce driving, a beautiful bay stretching like a river far inland. We arrived at low tide. The mud flats were emerging and the streamers of eelgrass swung seaward with the current.

"Colonel, old boy, I made it

on time," sang Jeff as he jammed on the brakes.

"You sure did," replied the Colonel, "and we'll have plenty of time for loading our buckets before high water returns."

That was my first lesson in crab hunting. To succeed with a dip net one must hunt at low tide. There was method in Jeff's madness.

We unloaded our outfit. The Colonel, true to his name, outlined a military plan for the campaign. Jeff and I were to wade along abreast, Jeff close to the shore, having shorter legs; I, a few yards farther out. The crabs which he missed might scuttle out in my direction; those which I missed might be made to veer into his net. The Colonel would row the dory in deeper water, startle the crabs inshore if possible, and take custody of those which we netted.

"You've got to be quick to catch those blue fellows," said he. "It's a game of speed and skill, but mostly speed."

No sooner had he spoken than I spied the first victim of the afternoon. I made a swift, triumphant stroke, and brought up the net—empty! The crab had escaped; I missed him entirely, and the roily water left no chance for further pursuit.

Jeff potted two of them soon after. Then I swung and caught one in the bag. I showed my catch to the Colonel.

"Too small," said he, "throw the beggar away."

But luck changed with fuller experience, and soon I too was snaring the big blue fellows, and dumping them from the net into the boat.

What sport it was to hunt those alert, swashbuckling pirates through their muddy haunts! Up to the present, so far as my knowledge of blue crabs was concerned, I had been a mere dining-room zoologist, knowing them only as delicacies, prepared by the art of a capable chef. A well-baked and savory dish of crabs will stir even a jaded appetite. But *Callinectes,* a wayfarer in his own haunts, has another and stronger appeal.

Out in the salt water bays and inlets, clinging idly to a tangle of seaweed, or lording it along the bottom, the blue crab is an object to attract attention. What a cock of the walk he is! He carries his dark, green shield bordered with red-tipped spines like a proud warrior. The blue arms with fingers dipped in blood seem set for action. Wary, suspicious, swiftly scurrying for cover, he is a challenge to anyone,—naturalist, lover of beauty, or sportsman.

I watched the Colonel as he deftly picked the crabs from the bottom of the boat and tossed them into one of the cannikins.

"How do you manage to pick them up without getting hurt?" I asked, for I knew that a blue crab's forceps can make a painful wound.

"Handle with care," he grinned. "But if you grab the crab in the rear at the base of the flippers — so! — thumb above, forefinger below, he can't reach you with his front pincers. Of course, the soft-shelled ones can't pinch, so you needn't worry about them. That's why the hard-shelled male protects the female just after she has shed."

Several questions occurred to me, the answers to which I knew, but I thought it would be interesting to hear the story in the Colonel's words, so I feigned ignorance, and was rewarded with the following monologue:

"The he's and the she's are plumb easy to tell apart. All you do is notice the shape of the tail. The male has a narrow abdymen. If it's broad and blunt, you have a lady. She needs a big tail to hold fast to the bunches of eggs which she carries around sticking to her bosom. These yellow beanies are the eggs, jest hundreds of 'em. Now when a crab grows, it's got to shed the shell every so often. Its crust gets hard and tough. Jest think if you had to live in one of those iron suits like the knights used to wear. If you wanted to grow at all, you'd have to go to the blacksmith and have a larger size made. You couldn't live in the same tin can all the time. Well sir, the crab knows that, and so splits the hard shell and crawls out of every bit of it. The whole crust comes off, even from the eyes and the toes. 'Now is my chance to grow, while the skin is soft,' it says, and in a short time it swells up like a puffer. Then the skin gets hard after a few days, and darn glad the crab is to have some protection again. But they're never satisfied. After a while they skin themselves again, jest so as they can grow fat some more. It's the soft-shelled crabs that

H. ARMSTRONG ROBERTS

"JEST TWO KINDS, THAT'S ALL"

"The soft-shelled, ten-legged crabs, and the hard-shelled two-legged ones! The first we eat . . . The second kind ain't good for nothing"

Lady Crab

bring the most money in the market, but city people don't know how to cook 'em. Jest roll 'em up in seaweed and steam 'em—that's the way. Then they'll melt in your mouth."

Jeff meanwhile was doing wonders with his net. He seemed to be picking crabs off the bottom where I could see no signs of them at all. Then I perceived the magic. He would go along and look for slight depressions or marks made in the loose bottom by a crab that had pushed its way backwards into the mud to hide. He would explore these signs with the tip of the net. Often a blue crab would rush forth from concealment with eyes popping out of his head and arms waving indignantly. The crab would try to scuttle away sidewise, but if cornered would present a bold front to his adversary, putting up his arms like a pugilist into a position of guard or attack. But Jeff generally made short work of such blustering vagabonds.

Besides the rugged blue fighters, we often encountered an occasional spider crab, a scrawny, ludicrous humbug, a mere caricature of a crab. This creature has a humpy, bulging, toad-shaped body with skinny limbs and emaciated claws. A spider it is to the extent of having long, slender legs, but its nature is so weak and sluggish that the comparison is a slur and an insult to all true spiders.

If the converse of the axiom about the rolling stone is true, the spider crabs ought to be prodigious gatherers of moss. So they are, and therein rests their salvation. Though living in the water, they never take a bath. Among their race eminence and an honorable old age are attained by accumulations of mud, moss and monotony. They allow their bodies to be coated over with ocean ooze which encourages the growth of weeds, hydroids, worm-tubes and other marine miscellany. Such a covering is excellent camouflage. Unostentatious creatures, they seek a complete obliteration of identity. "If you would have peace and happiness," they seem to say, "become in-

Spider Crab

conspicuous. The dull and mediocre no one troubles to trouble."

Not only does the spider crab passively encourage the growth of a marine garden on his carapace, but he frequently is the gardener who plants the vegetation there. He has been observed to snip off bits of sponge, sprays of *Bugula,* hydroids or fronds of seaweeds and actually place them into position on his back, head or legs. The cut ends he first touches to his mouth, smearing them over with his oral cement, and then glues them into place or catches them in the fine hairs which mat his dorsal surface. As he moves into a new neighborhood, he will modify his make-up to suit the character of his surroundings.

This masking habit has undoubtedly a defensive purpose, but it is just as important as an offensive strategy, enabling the crab to steal upon his prey unnoticed or to lie in wait for it unseen. The dramatic episode of the walking wood of Birnam which marched on Dunsinane is a common occurrence on the ocean bottom where spider crabs stalk their kill.

Many strange and curious wonders of the seashore popped into view every now and then. Sometimes it would be a flat flounder moving off like a piece of detached bottom caught by the tide, its deformed head and eccentric eyes a startling sight. Sometimes a lean pipe fish, coiled about a weed stalk, shamming resemblance to a dead plant stem, would eye us for a moment, waiting to see whether he was discovered, then slither quickly away into the underwater prairies. A gleam of brightest red made me risk submersion in my curiosity to see what it was. Brought to the surface, it proved to be an odd sponge, *Microciona,* branched like a bunch of coarse twigs dipped in crimson wax, and growing upward from an empty oyster shell. It was a brilliant plume, almost barbaric in beauty. I thrust it into the band of my hat and felt as proud as a naked savage who has just bartered all his possessions for a bit of bright calico.

"Jump aboard," said the Colonel, finally, "we got plenty crabs. No use to try for more; the tide's too high." But I had spotted another crab, and wanted it.

"Just a minute, Colonel, till I get this beauty. Just one more," I shouted.

The beauty was no blue crab, but another species even more strikingly handsome. I scooped it up and showed it to the Colonel.

"Pooh, that there is a lady crab, no use to us," he scoffed.

"But it's beautiful, Colonel, isn't it?"

"Crabs are crabs, and jest because it's called a Lady ain't no sign it's beautiful."

"I'll bet you, Colonel, this crab is called 'Lady' because it is beautiful, not the other way around. Why, look at that velvet costume, delicate green, flecked with red, purple peacock eyes for ornaments; gracefully rounded shield, claws symmetrical and nicely proportioned, trim little ovals for swimming plates,—why, she is a regular mermaid!

"I saw one of them the other day on the beach, promenading along as pretty as you please. When I disturbed her she cut a furrow into the sand with her sharp flippers and sank down out of sight. Why, she disappeared so quickly that I couldn't believe my eyes. I dug her up and made her repeat the performance. Do they generally live on the beach or close to the shore?"

"Much of the time," replied the Colonel, "they gad about in the shallows, but they swim far out in deep water, too. They like to hide in the sand with only their eyes sticking out on stalks. When the killifishes get too close, a claw shoots out from hiding and grabs one,—then goodbye fish!"

"Colonel," I said, as we started home, "you sure know a heap about crabs. Can you tell me how many kinds are found around here?"

He looked fiercely at Jeff, then replied with sorrowful dignity: "Jest two kinds, that's all—the soft-shelled, ten-legged crabs, and the hard-shelled two-legged ones! The first kind we eat and they're welcome in the best sassiety. The second kind ain't good for nothing, ain't even fit company for the cohawgs out there in the mud!"

The oracle had spoken. Nothing more could be added to that epitome of crabology. So I was silent.

There is no need to introduce Nature lovers to Herbert Ravenal Sass, who contributes the leading article in our September issue. The prose poet of the Carolinas writes of Curlewtown, a name he has given to a spot he seeks to meet Nature and know her. With Charles Livingston Bull supplying the illustrations, Samuel Scoville, Jr., writes another of his reptile stories next month. Stephen Haweis contributes an entertaining and thought-provoking article entitled, Why a Zoo? Alexander Sprunt writes of another of the group of birds facing extinction, this time the Whooping Crane. Mrs. Frances Dawson draws upon the notes and negatives of her late husband, William Leon Dawson, for a fascinating story of the Limpkin, bird of Florida. These are only a few of the rich features for September.

THE POSE THAT WARNS

KEEP YOUR PLACE!
Forelegs and pedipalps spread wide, black fangs unsheathed to strike, tarantula terrifies — and bluffs

by Gayle Pickwell

Photographs by the Author

BACK in the dim phylogeny of tarantula some ancestor, beset perhaps by one of the few enemies this formidable creature has, developed a new pose. It was: to rear stark upright in the air, with forelegs and pedipalps spread wide and, most terrorizing of all, with black vertical fangs fetched out of recumbent grooves, unsheathed to strike. An ogre this, in Gargantuan attitude, to develop deepest fear.

But, unlike Gargantua, Tarantula poses thus only for self defense. Protection she seeks not by fleeing wildly and in terror but by facing the enemy bravely and rearing thus to intimidate the foe.

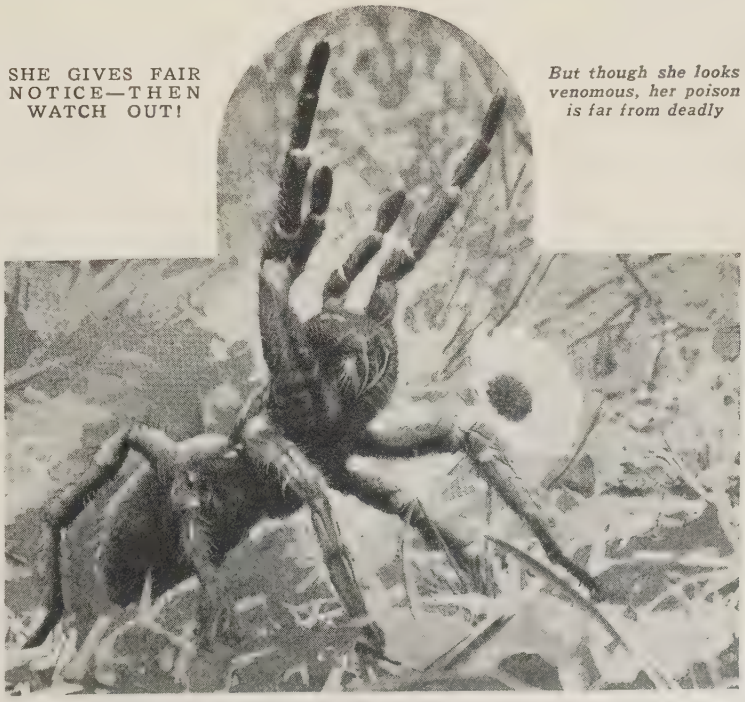
So reluctant is Tarantula to strike that, if annoyance persists, the erect posture may become so high that the great spider topples over on her back and there lies, not unlike a cat, with legs and fangs spread out to grasp the enemy.

Impressive as the attitude may be, to the uninitiated it seems a bit absurd, for reared thus the cluster of eight eyes on top of the head is hidden from the aggressor and so is useless to Tarantula. Perhaps the eyes, so near-sighted, are, after all, of little moment. Tarantula may feel secure in terrorizing by the attitude, needing not to see the subject terrorized, or, more likely, she relies on other senses. Certainly she hears, for the click of a camera shutter caused a start and elevation of the legs. And the slightest touch caused the fangs to swing still farther out.

It may be because she cannot see her enemy that the pose is held for long periods, minutes at a time. So motionless is it held that exposures of five seconds show that not a hair or seta moved.

It must not be presumed that Tarantula never strikes. She does. Unduly annoyed she gives up the pose convinced that her annoyer lacks appreciation of timely warning. Upon her tormentor she then springs, clasps him tight and drives in the fangs with a vehemence that is resounding in its violence. But give her credit. To strike unnecessarily is not her method; fair warning lies demonstrated in the tigerish attitude. What happens if it is not heeded is not the fault of her who warns.

SHE GIVES FAIR NOTICE—THEN WATCH OUT!



But though she looks venomous, her poison is far from deadly

Of poison, however, so far as man is concerned, there is very little. Her reputation as a deadly poisonous creature comes, no doubt, because, reared up, she "looks" so poisonous. Even to capture insects such a powerful creature should need little else than her mechanical ability. Scientists have

demonstrated that there is little poison in this group and the author, once digging tarantulas, put his finger in the burrow to estimate the remaining depth. Sharp, pin-like daggers struck the finger. Instant withdrawal brought, clasped about it, an outraged tarantula. Two pin-holes marked the entrance of the fangs from which small marks two tiny drops of blood soon showed. Yet, thirty minutes later, the fang marks had gone, and no poisonous effects were ever felt. I had driven tarantula to do her worst, and even that was not very bad.

The Striking of the Rattlesnake

by Doris M. Cochran

CONTRARY to popular opinion, the rattlesnake does not bite in the sense that a dog or cat bites. It is far more accurate to speak of a rattlesnake as "striking" its prey.

The fangs with which the rattler does its striking are highly specialized teeth, usually two in number, which are situated a little distance apart at the anterior end of the upper jaw. There is a sheath of whitish skin which comes down from the roof of the mouth and covers the base of the fangs completely, stretching down nearly to their tips. In our largest North American rattlesnake, the diamond-back, *Crotalus adamanteus,* which is six to eight feet long when fully grown, the fang measures seven-eighths of an inch from base to tip. In structure the tooth is very much like a slightly curved hypodermic needle, being hollow throughout its length and tapering off to a needle-like point at the tip. The base of the fang has a small circular opening which connects the hollow channel inside the tooth with a duct leading along the snake's upper jaw to the huge poison gland which is situated behind the eye on each side of the head. It is the presence of these glands which gives the characteristic triangular or arrow-shaped appearance to the head of a poisonous crotaline snake when viewed from above.

HOAG AND FORD

THE RATTLER'S FANGS

They are covered with a sheath of white flesh, which is withdrawn only when the striking occurs

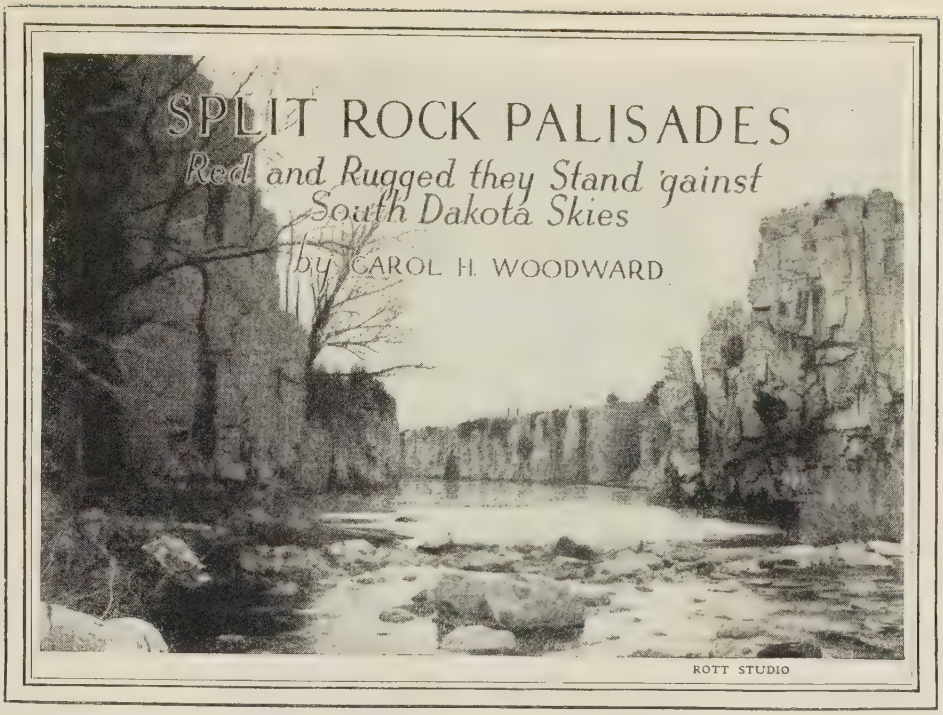
The fangs of the rattlesnake are not fixed tightly to the jaw-bone, as is the case in the dog. Instead the fangs are fastened at the base to a movable bone in the upper jaw which is muscularly controlled, so that when the snake's mouth is closed and the muscles are relaxed the fangs lie parallel with the roof of the mouth and pointing backwards. With the opening of the mouth to strike, some poison is pressed from the glands to pour down the ducts into the channels, while at the same time the fangs are automatically brought to striking position, so that they are approximately at right angles to their former position. Due to the very wide gape of the snake's opened mouth, the two fangs at the moment of striking are in a most favorable situation to inflict two deep incisions into which the poison instantly drains from the needle points of the hollow fangs.

If the victim does not succumb at once, it may wrench out these loosely attached fangs in its struggles to escape. This does not long incapacitate the snake, however, because there is a cluster of smaller undeveloped fangs lying near the base of each of the functional fangs; one of these small ones begins to enlarge and very shortly is ready to take the place of the lost functional fang. Indeed, rattlesnakes regularly shed their functional fangs about every three months.

It is sometimes believed that rattlesnakes can deliberately throw poison at their intended victims, but such is not the case. The poison falling on unbroken skin is harmless. It is only when the poison enters the blood stream that it becomes dangerous. There is a true "spitting-snake" in Africa, but this is related to the cobra and not at all to the rattlers. Of course, drops of poison may sometimes be shaken from the tips of the protruded fangs as the snake falls forward after having missed its mark; this, however, is in no way comparable to the action of the real spitting-snakes.

Frequently it is reported by thoroughly frightened persons that rattlesnakes have "jumped" at them from the ground, hurling themselves some distance into the air in the leap. Such a statement is greatly exaggerated. By coiling itself tightly, the snake can secure sufficient leverage on the ground to permit it to throw one-half of its body forward in striking. That is to say, a snake six feet long would have a striking range of possibly three feet on all sides of its coiled body.

In addition to the fangs, the snake's mouth is equipped with short, solid teeth set in patches,—four patches on the upper jaw and two on the lower jaw. These teeth are not poison-bearing, and are useful only to hold the prey which the snake is about to swallow. They are sharply curved backward, pointing down the throat just like the teeth of all snakes and most fishes, and are tightly fastened to the immovable part of the jaw bone.



WHEN the thunder-god smote the heavens with his lightning steel one night a spark flashed down to earth. Straight toward a chain of red rocks in the prairie land it fell, splitting them apart with a deafening groan.

The winds blew and the floods came and made a river. Ages later, when white men settled in the state of South Dakota, they named this river the Split Rock, and the rugged walls between which it flows they called the Palisades.

A mile and a half southwest of Garretson, in the southeastern corner of the state, massive cliffs of red Sioux quartzite rise on both sides of the narrow river. Like a castle of feudal Europe King Rock stands firmly fifty feet high above the river bed, attached only at the base to the wall along the shore. A dusky cedar tree has sprung from a crevice near the top, and all down the sides of the great rock are lichens and liverworts blended in soft grays and greens.

A few feet farther down the river is the Queen Rock, like a smaller castle, and across the channel, high above the bank, rests Balanced Rock on its pedestal scarce a foot and a half in diameter. Like a careless stack of pasteboard boxes this rock rises twelve feet above its narrow base, apparently ready to topple at the slightest breeze. But since man can remember the balance has been maintained, and the top-heavy pile of quartzite looks down on the river season in and season out, piled high with snow, drenched in the rain, and fired in the summer sun.

ROTT STUDIO

QUARTZITE CLIFFS

Rise on both sides of the Split Rock River. They are the product of earthquake and erosion

Above a nearby natural fireplace and spreading mantel at the river's edge a chimney rock rises almost to the top of the bank some forty feet above. On the same side of the river in a spot which can be reached only by precarious climbing the Devil's Kitchen stands, and its broad-wedged rocken ceiling hangs like the sword of Damocles above the head of the intruder. The exit leads to the river, via a sheer drop of twenty feet.

Just outside the town of Garretson itself is the rest of the devil's dwelling place, the Gulch, into which one may climb by descending the Devil's Stairway. Few outside of Satan himself could ever enter his red rock house, for the way down is rough and steep, and at the bottom is an icy pool, partly fed by springs, whose depths no lines have ever been able to fathom.

There are many onlookers in the Devil's Gulch. Standing at the bottom of the stairway one can distinguish nearly a dozen faces clearly sculptured in the rock, eyes gazing dully at the opposite cliff or into the still, black waters at their feet. Unlike the rocks in the Palisades themselves, which are sharply edged like rows of bricks, the lines in these faces have all been weathered smooth, making them strikingly realistic in contour.

A nun of medieval days, delicately featured and wearing a flowing coif, lifts her chin above her admirers on the right hand side of the canyon. Men's faces gaze across at each

other, and animal heads repose in the blood-colored rock.

On the river a mile north of Garretson stands a rock on which Nature has sculptured a supposed likeness of George Washington. Mark Twain's head is seen by the imaginative on the opposite side. Another broad slab of quartzite is called Indian rock, for the head of a flat-nosed warrior was carved there by the glacier many centuries ago. On this same rock stands a moustached gentleman, resembling one of the early hunters of the region. At least, many claim to see these faces.

Legend has it that in the early days, before the white men had settled South Dakota, a hunter or trapper working near the gulch was attacked by Indians. He tried to escape on foot, and one red man followed him on horseback. The Indian was almost upon his heels as he reached the narrowest part of the gulch. He feared he could not jump it even here. Feeling, however, that death in the water beneath would be preferable to death by torture, he leaped—and landed on the other side. The Indian spurred his horse to follow after, but the animal missed his mark, and horse and rider were drowned in the bottomless pool. It is believed by some that spirits still guard the spot where the Indian met his death.

Jesse James, the outlaw, also is reputed to have leaped across the canyon when pursued after his robbery of the Northfield, Minn., bank. A footbridge now spans the chasm at the narrow point.

The stream which empties into the Devil's Gulch in springtime and in wet weather comes from a meadow more than a mile northeast of Garretson where it is fed by springs and melting snows. As it has washed away the loose soil in its course it has exposed broad ledges of red quartzite. In the spring when the stream is full it tumbles into the canyon over a twenty-foot cliff, sending its foam sometimes thirty feet into the air.

From the Gulch the water flows into the Split Rock where for several miles the red cliffs line the river. Occasionally a lone sentinel stands out where the broader walls are submerged by grassy banks. Along the sloping shores and up through pastures blocks of quartzite are scattered as though building blocks thrown there in play by giant children. Some of these rocks have been polished like marble by the ice of an aeon ago, and many bear deep glacial scratches.

ROTT STUDIO

CHIMNEY ROCK

This boulder flue rises nearly forty feet above the natural fireplace and mantel below

On the Big Sioux River, which gives Sioux Falls its name, and at other places through this region the red quartzite crops out continually in cliffs and ledges and splatterings of broken rock. About a mile and a half from Garretson, again on the Split Rock, is a cave in which, old timers relate, Jesse James hid once during his bandit days.

Along the river down to the Palisades are remains of mines which were started in the early days when a trace of silver was found in the rocks. The silver, however, proved to be worthless; of much less value than the rocks themselves, for "Sioux Falls granite", as the quartzite is commonly called, is quarried for buildings, roofs, and roads.

Outcroppings of this rock reach north and east into Minnesota, south into Iowa, and west for some distance in South Dakota. Though largely hidden by glacial drift, specimens have been found nearly as far west as Mitchell.

The rocks have stood there for tens of thousands of centuries, geologists say. The rectangular cracks which have split the Palisades into almost perfect mason's bricks occurred at least a hundred million years ago, at the time when a great mountain range extended along the southern border of eastern Canada. Forces within the earth pressed upon the rocks from north and south, and at a different time from east and west, so that the rocks, being brittle, cracked in both directions. Some of the cracks were so long and broad that they made great passageways through the cliffs. It is through these channels that centuries later a river began to flow, the river that today is called the Split Rock.

ROTT STUDIO

KING AND QUEEN

Of the Palisades are these rocks, more than fifty feet above the river, dignified and graceful

The quartzite of the Palisades was at one time common sand, then later a sandstone probably cemented together with calcite. Water from the soil seeped into the soft rock, bringing with it a new cementing material, silica. Slowly, slowly, the calcite was washed out and the silica carried into its

place. With it came new quartz crystals which fitted themselves beside the others, giving the rock added strength. The metamorphosed stone dried, and it is in this condition that it stands today, probably the hardest building stone known.

So hard is it, in fact, that at Pipestone, Minn., near where it is quarried, are Indian inscriptions on a number of flat rock surfaces which show almost no signs of weathering, though they were chipped there probably several hundred years ago.

There are many beautiful rock formations throughout the United States. But here along the banks of the Split-Rock, through the Palisades, Nature has achieved something different, it has given an impression of age and weariness. The faces in the mysterious Gulch—ancient, prehistoric faces, like those of mummies, hinting at a long-disappeared, forgotten civilization. The red, rugged cliffs, brick-like, the constructions of great workmen who grew tired of their labor, and left them rough and uneven to take up other things. The great blocks of quartzite, scattered over the meadows, seeming but huge building blocks which old forgotten gods once played with when they were young. Here might have the Titans gathered to war on Olympus,—here might have ancient legions of the Satanic powers, whose names have been perpetuated among these rocks, collected their forces, long ago, long before the red man came, or Sunday picnickers, digging for souvenirs with their jack-knives in the cliff.

ROTT STUDIO

BALANCED ROCK

Its twelve foot bulk looms up from a base less than two feet wide

Indians used to carve this clay-like rock into pipes and ornamental articles. Beside the red outcropping along the Split Rock is a grayish variety, mixed intimately with the earth of the bank, which shows a delicate pink when polished.

After the earlier days in the Split Rock valley, small boys superseded the Indian artisans in carving the pipestone. But they have abandoned their old pastime now, and their place is being taken by the weekly swarm of picknickers and tourists. Gone are the serious sculptors. There remain only dozens of persons sitting of a Sunday on the dusty bank, digging and scraping with their jack-knives, destroying this ledge of rare stone to satisfy their greed for souvenirs.

Albino Gray Squirrels

A Hereditary Trait Amuses the Illini

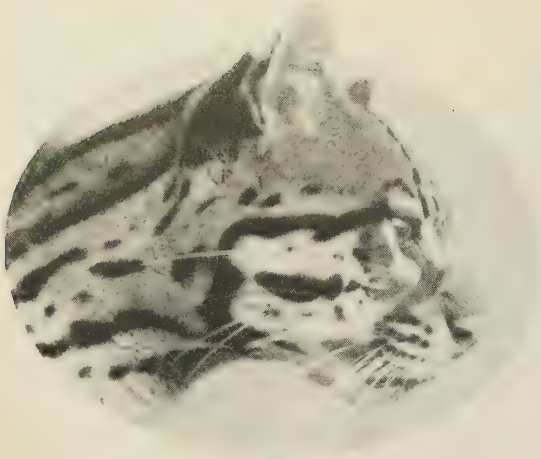
by O. M. Schantz

Albinos and partial albinos are frequent occurrences among birds, but the development of a colony of albino gray squirrels at Olney, Richland County, Illinois, is one of the rare cases where albinism has been hereditary without assistance from man.

In 1908 a farmer discovered four white squirrels in a gray squirrel's nest. The parents had no trace of even partial albinism. A friend was given the youngsters, and finally released them in a small grove in the north part of Olney. And here they prospered, the colony numbering at one time about 125.

There have been occasional partial reversions to the original gray, and not all of the squirrels have pink eyes. Those with black irises have normal sight, but the others have been frequently run over by automobiles because of their defective vision. In habits, these albinos resemble the common gray and their black brethren.

Each year warfare occurs between blue jays and the white squirrels, the jays making a business of trying to rob the squirrels of nuts by swooping down and frightening them. The squirrels, however, soon learned a defence, and now eat their finds on the ground.



SANDINO
Much more easily caught than his namesake, the ocelot proved tractable and a fine pet

SANDINO—
A Nicaraguan Pet

The Marines Enlist a Mascot

by Lewis W. Walker

Photographs by the Author

Two hundred yards from the shore of Lake Managua, near the capital of Nicaragua, stands a rocky hillside, the home of Sandino's infancy. Fauna of the region is varied in color and habits. In the trees live brightly-colored parrots and raucous-voiced monkeys; about the lake are many ducks, shore-birds, and egrets, and in the jungle surrounding this body of water live the sly, clever animal outlaws of the region, the ocelots, or as the natives speak of them, *los tigres*.

Everyone's hand is against them. Relentless persecution is theirs, and there is no refuge to which they can retreat. Many people make the statement that they are untamable, but the life of Sandino shows them to be not only capable of being tamed, but as affectionate and playful as the best of pets.

Sergeant Gordon Hoppe of the U. S. Marines learned from native reports of the presence of an ocelot family. There was bitter complaint that a clever *tigre* was stealing their chickens. He evaded all traps and snares, and efforts to trail him to his home were fruitless. The dogs lost his scent when they arrived at the lake, and always failed to pick it up again. Sergeant Hoppe's interest was aroused, and any peculiar noises or movements in the jungle were carefully investigated. His efforts, however, were in vain. Then one morning early in June, 1927, he heard a great commotion among the monkeys. Many times in the past he had heard them, but he had never been able to discover the cause of their panic. He decided to try again. They were far up in the trees, but were trailing something on the ground. He followed their excited chattering and soon came to the rugged hillside. At its base stood the animal he had received recent orders to shoot to kill. In its mouth was a spider-monkey, common to the region. He shot and they both dropped.

Examination showed the ocelot to be a mother, so a hunt for the den was started. Tufts of fur and feathers guided him to a ledge which ran in front of a natural crevice in the rocks. At its entrance lay the carcass of a parrot, and a foot or so beyond,—a handful of spitting, scratching energy,—a young ocelot. Its eyes were barely open, and its age was estimated to be ten days at the most, but instinctively it feared and hated the sight and scent of man. He was placed in the Sergeant's hat, and covered with a handkerchief. In this way they arrived at camp.

After the orphaned ocelot had been left alone for an hour or so he started to whimper and cry as though hungry, hence the marines made preparations for his first meal. These consisted of a half cup of milk, heated to body temperature, and the finding and cleansing of a small medicine dropper. The first few meals were rather forced. One marine would hold Sandino's feet, and another would squirt the luke-warm milk down his gasping throat. After several of these feedings he began to lose his fear, and would crawl out of the Sergeant's hat, which had been his home since his capture, and open his mouth when he heard the clink of the medicine dropper against the side of the tin cup. He was fed in this way for about a month, and then this system was stopped for two reasons. One was that he was large enough for a regulation-sized baby's bottle, and the other was that his jaws had become so powerful and teeth so sharp that he had acquired the habit of biting the glass tips off the droppers!

About this time another detachment of marines arrived in camp, and their commonest remark about the mascot was the warning to "Wait another month till

A THOUGHTFUL POSE
Perhaps Sandino is thinking of his lost freedom, but more likely it is of the next meal

that cat gets bigger. Then we'll call a stretcher-bearer." This was two years ago and their prophecies have not yet been fulfilled.

As months passed Sandino was weaned from the bottle. His diet changed from warm milk to vegetables and cooked meat. He took a several weeks' trip on a government destroyer from the coast of Nicaragua to the Marine Base at San Diego, California.

After arriving in the United States he became sullen, and no longer played with shoe laces or dangling neckties as he did in the past in Central America. Then it was noticed that he did not have the full use of his front feet. He was becoming paralyzed. He had developed that curse of hand-raised animals, rickets, a malady caused by under-nourishment or the wrong kind of food. Raw meat was suggested as a cure by the San Diego Zoo. This advice was followed, his legs grew stronger, and in a short time he had regained his normal health. Once again people commented on his tameness, but prophesied a fierce animal in a short time if the raw-meat diet was continued. That was ten months ago. He is tamer and healthier now than ever.

One very interesting uncatlike trait of Sandino's is his love of water. He delights in having the hose turned on him, but growls and looks mean at the start. Sometimes after these water baths he becomes extremely playful and ticklish, and is liable to jump upon any one within reach until he is played with. His owners understand this mood, and respond to it, but he is generally considered too rough for the average person.

Auto riding is another pleasure which Sandino enjoys immensely. He is turned absolutely loose in an open car, and runs from one side to the other in anticipation, until the car is in motion. Then he quiets down and lies on one of the seats allowing the wind to blow in his face. Care has to be exercised on these drives, however, when nearing a horse or going by a stable. For some unknown reason Sandino seems to fear these animals, and whenever they are within sight or smelling distance he raises his fur and growls ominously, and then seeks the nearest hiding place.

After I had seen Sandino frolicking and playing with the cats and pups of the neighborhood, I thought it might be interesting to introduce him to my pet bob-cat, "Bobby." Both seemed fascinated by each other, but whether as friend or foe, we did not know at first. While on the leash Bobby was the most playful of the two. They walked together and rubbed foreheads. When the leash was removed, however, like a shot, before Sandino's owner or I could interefere, the fight was on! Bobby rolled over on his back, and the ocelot pounced on his chest, but he did not stay long. One powerful upward sweep of Bobby's hind feet dislodged him. From then on until we separated them, Sandino was satisfied to continue the fight with ferocious slashes from a discreet distance. Neither of the contestants seemed any the worse for their battle, but both were terribly frightened. Sandino, although pretending to be ferocious, allowed his master to pick him up, but Bobby remained terror-stricken and fighting mad for about forty-five minutes after the battle.

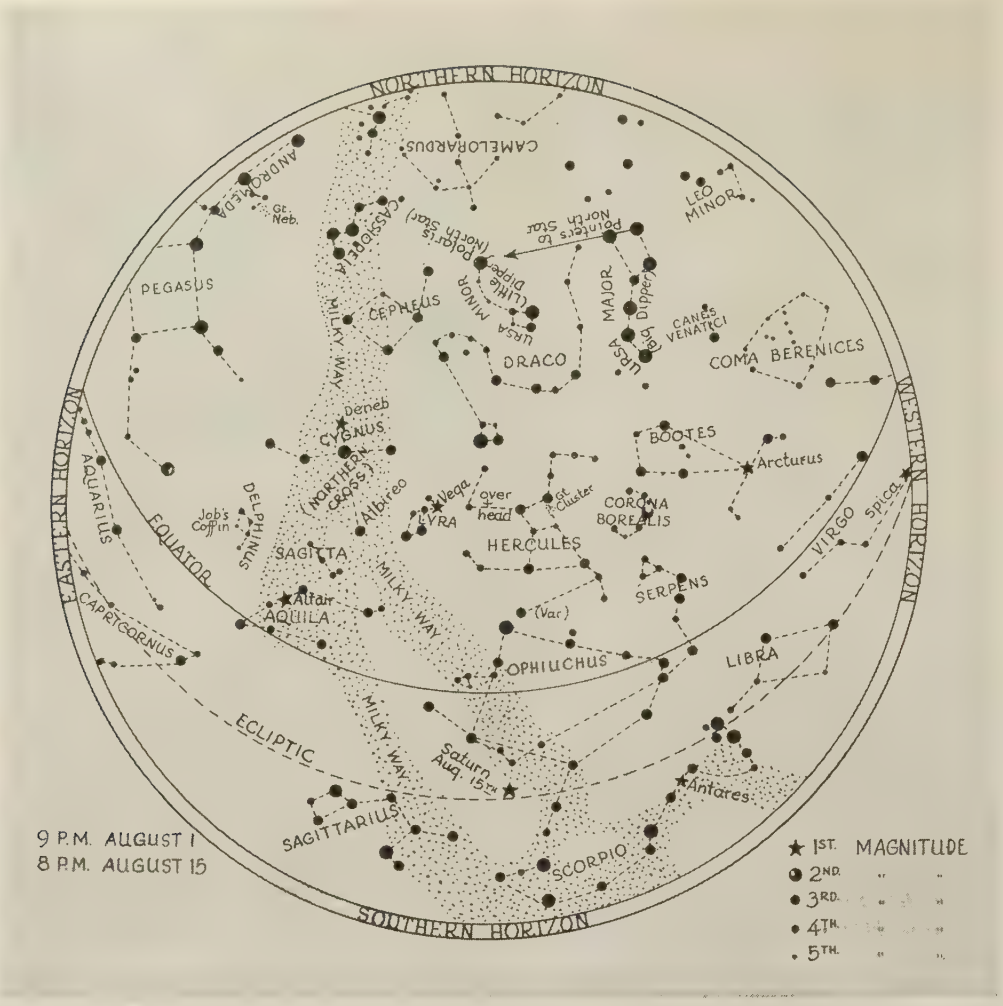
JUST A PAIR OF BUDDIES
A real affection has grown up between the two since Sandino was found by his human friend

A CONFIRMED TOURIST
The ocelot craves more and more speed, and accompanies his owner, Sergeant Hoppe, everywhere

Many things have happened to Sandino in the past few months, and he has a new master. He has been sold to Mr. Stiles, the owner of a fur farm at Mt. Lowe, California, and has proved as kind a pet in his hands, as he was with his first human friend. Sergeant Hoppe is back in Nicaragua, Sandino's former home, and hopes to bring back a tame breeding pair of ocelots when he next returns. It will be quite a feat, and the visit of this Marine to America will be looked forward to with interest.

Mr. Stile's Sandino is not the only ocelot pet in America at present, however. Captain Harlen Pefley, situated at the marine barracks navy aid, Philadelphia, recently brought back from the same country another ocelot—and evidently the same godfather stood in at this christening as in the other, for his animal, likewise, is named Sandino. This creature is reported to have been bought from some Nicaraguan children, who either pointed it out to Captain Pefley or had already captured it themselves. It is understood that it is taking as readily to America as the West Coast cat.

With the result of these two experiments already established, it is clear that the ocelot can no longer be termed untamable and treacherous. Of course, the creature is a cat, and any cat, be it a fireside tabby or a Miocene sabre-tooth, thinks only of self. But the ocelot can conquer its fear of man, and learn to regard him as the source of food and amusement, and to be happy



TO USE HOLD OVER HEAD WITH TOP TOWARD THE NORTH

How Did They Get That Way?

Concerning Further Problems of the Heavens

By Isabel M. Lewis

The two best known theories of the origin of the solar system, the Nebular Hypothesis of La Place and Planetesimal Theory of Chamberlin and Moulton, have been considered in the two preceding articles. The first of these, it will be recalled, pictures the planets as evolving from a slowly rotating, contracting solar nebula through the abandonment of rings at certain intervals which were assumed to become unstable and to break up finally to form the planets. In a similar manner satellites of the planets were formed from the planetary masses as they in turn contracted. It was also shown why the nebular hypothesis finally became discredited because of glaring discrepancies between the facts and the theory.

The Planetesimal Theory of Chamberlin and Moulton, which was next considered, has proved to be so far the most satisfactory of modern theories which attempt to explain the origin of the earth and other members of the sun's family. It attributes the birth of the planets to the influence of a passing star and shows how this caused streams of sun-substance to be shot forth from the sun both toward and away from the disturbing body. The larger masses in these streams formed the nuclei of future planets and neighboring secondary nuclei became their satellites. Gradually these nuclei swept up the smaller particles in the streams—the planetesimals—and grew to their present dimensions.

Certain modifications of the planetesimal theory have been introduced in recent years, notably by the Tidal-Action Theory of the English astronomer and mathematician, Dr. J. H. Jeans. This differs from the

Planetesimal Theory of Chamberlin and Moulton, however, only in minor details. In Jean's theory the expulsion of the streams of sun-substance is assumed to be a result of tidal forces alone, whereas in the original planetesimal theory the eruptive tendency of the sun, which shows itself even today in periodic outbursts of sunspot activity, was as important a factor at the time of the birth of the solar system as the tidal forces acting between the sun and the passing star.

In Jeans' theory it is assumed to be proved that the original planetesimals were liquid and not solid soon after they left the sun and the interiors of the planets were assumed to have remained in a liquid or gaseous state at least to a late stage in their development. According to the Planetesimal Theory it is impossible to determine from our present knowledge what was the physical state of the nuclei at the time of their expulsion from the sun. It has been assumed, however, that throughout its period of growth the earth remained solid through and through and gradually increased in mass through the addition of planetesimals. Aside from such minor differences the Tidal-Action Theory of Jeans and the original Planetesimal Theory of Chamberlin and Moulton are practically identical.

As we search for other modern theories of the origin of the solar system we find none that have been worked out with as great attention to detail as these last-considered two. There is a possibility that the birth of a solar system might attend the sudden outburst of a Nova. It has been discovered that Novas occur in such great numbers that it is probable that every star in the heavens has at some time passed through the Nova stage. A Nova, it will be recalled, is caused by a sudden tremendous multiplication, amounting often to many thousand-fold, of the radiance of a star. The outburst lasts only for a brief period of a few days or weeks and is followed by a rapid decline in brightness. Often the star returns to its former brightness but retains a nebulous envelope. Not only may a solar system be born at such a time but an existent one may at the same time be destroyed by the sudden release of an inconceivably great supply of light and heat from the star. Some stars may have passed through the Nova stage several times in the course of their existence. Their lifetime, it is now believed, is to be measured in billions of years rather than in tens or hundreds of millions of years that were allowed when the contraction of a solar nebula was assumed to be the only source of solar light and heat. On each of these occasions it is possible that a family of new satellites may have been born and an existent system wiped out.

A possible cause of the outburst of a Nova is the encounter of a star with a group of meteoric masses, possibly of planetary size, drifting through space. Such encounters in the course of a journey through the stellar universe lasting some billions of years and covering a distance of many thousand light years is not only possible but extremely probable. The outburst of a Nova is a purely surface phenomenon, it has been discovered. The internal mechanism of the star is practically undisturbed by the encounter. Otherwise the star would not so rapidly return to its former state. Though in some instances it acquires a nebulous envelope known to exist for some years at least there are other cases in which the star has become sharply stellar in appearance a few years after the eruption.

It is not known, of course, how great may be the number of dark bodies in space. There is abundant evidence of the existence of vast dark nebulas and clouds of cosmic dust in the universe. Often they show in projection upon a background of brilliant star clouds of luminous nebulosity. It is also known that there are streams and swarms of meteoric masses as well as comets that apparently enter the solar system from interstellar space. It is conceivable that an encounter of a sun with a meteoric swarm of exceptional size or density might produce disastrous results for it and its existent family of planets. Direct encounter of the sun with meteoric masses great enough to cause the craters that exist on the surface of the moon would produce a disturbance in the solar atmosphere sufficient to cause a celestial catastrophe.

There are many facts to be explained by a theory that aims to account for all of the observed phenomena of the solar system with any degree of success. Why do all of the major planets lie nearly in the same plane and revolve around the sun in orbits that are nearly circular? Why do the great majority of the satellites, planets and the asteroids revolve around the sun in the west to east or counter-clockwise direction, which is also the direction of rotation of the sun and most of planets on their axes? What is the cause of the rings of Saturn, of the retrograde, or east to west, direction of revolution of the outer satellites of Jupiter and Saturn and of the fact that one of the satellites of Mars revolves more rapidly around Mars than the planet turns on its axis? All these facts are contrary to the assumptions of the Nebular Hypothesis. How are the comets, the meteors and meteorites, the Zodiacal light and the Gegenschein to be accounted for? Why are the four outer planets approximately ten times greater in diameter than the inner or terrestrial planets and of about the same density as the sun while the terrestrial group are extremely heavy, dense bodies apparently solid throughout? What was the origin of the unique earth-moon system and the cause of the lunar craters? All of these questions must be considered in developing a successful theory of the origin of the solar system. Up to the present time the Planetesimal Theory of Chamberlin and Moulton seems to be most successful in explaining and coördinating all of these facts. The discovery of the sub-atomic source of solar energy, which permits the time-scale of the universe to be greatly increased and gives the sun a lease of life of many billions of years in place of the few tens of millions of years granted by the contraction theory of the sun's heat, has increased the possibilities of close approaches of stars and removed one of the greatest objections to the Planetesimal Theory. The arguments in favor of the Planetesimal Theory of the origin of the solar system are therefore stronger today than they have been at any time since the theory was first advanced near the close of the last century. It is a theory that should be studied by all who wish to be familiar with the best astronomical thought regarding this important question of the origin of the solar system in general and

question of the origin of the solar system in general and of the earth in particular.

In studying the heavens this month do not fail to watch for the August meteors or Perseids which are probably the best known of all swarms of meteors. They are moving in an orbit identical with that of the great comet 1862-III, which has a period of 120 years. Although they may be seen in greater or less numbers up to August 25, the greatest display will occur on August 10 and 11. They should be seen in greatest numbers about midnight. Their paths apparently converge to the radiant of the stream in the constellation of Perseus. This is, of course, an effect of perspective, as the meteors are really travelling in their orbit in nearly parallel lines. Perseus rises far over to the northeast about nine p.m., August 1. Vega is now nearly overhead. This star and Arcturus, now in the western sky, are almost exactly equal in brightness but very different in color. Arcturus is of orange hue, Vega a brilliant bluish-white. They are the two brightest stars visible at this time. Spica in Virgo, now close to the southwestern horizon; Antares in Scorpio, low in the southwest and called Rival of Mars because of its deep red color; Altair in Aquila in the southeast; and Deneb at the top of the Northern Cross which lies directly east of Vega are the other first magnitude stars that are now in the heavens. Mars is now getting too close to the sun to be seen. On the fifteenth it sets about an hour after the sun. It passes into the constellation of Virgo early in the month. Saturn is now between Sagittarius and Ophiuchus, nearly due south early in the evening and sets about midnight.

Jupiter is now in Taurus and rises about twelve. Venus is a brilliant morning star and rises about three and one-half hours before the sun on the fifteenth in Gemini. Mercury will not be in a favorable position to be seen this month although it will be in the western sky early in August and in conjunction with the moon on August 5. It will pay to observe these heavens.

The Oak

by E. A. Preble

You dwellers in the desert, or in the unshaded street of the city, what would you give to have a giant oak spreading its sheltering arms over your dwelling, keeping cool your yard, and echoing the voice of the evening breezes? And if you had such a tree, would you urge its destruction? Would you not try to keep it forever?

But this tree grew on public ground beside a house in the suburbs of a well-known city, and the owner of the house had it uprooted and thrown away in spite of the protests of his neighbors, and the whole community. And all the while the tree really belonged to the people of the city, and of the nation.

About the time that our first president retired to his home on the forested hill called Mount Vernon, a white-oak acorn fell to the ground from its parent tree, and a prudent squirrel buried it in the leaf-mold. It sprouted and in due time grew to be a lusty tree. The passenger pigeons, now vanished, feasted on its fruit, and a hundred generations of squirrels played in its branches and stored in the fertile earth its seed, as they had those of its parent. At nightfall the wild deer stole from the sheltering forest and munched its sweet acorns. The deer and the pigeons passed away, but the tree grew on, and gave its fruit to the jays and grackles. As the years crept by a few farm-houses were built here and there within the tree's domain, its companions were taken one by one, until it stood alone. Buildings came. Men and women passed it night and morning and admired its massive trunk, and its broad-spreading branches, and took away with them pleasant memories of its presence. The tree yearly became more dear to the community.

Then a rumor arose that the great tree was to be cut down. He of the house that was sheltered by the venerable oak complained that its acorns rattled on his roof, and that he feared that the tree itself would fall. The friends of the veteran pleaded for its life, but their appeal was unheeded. One morning a gang of men skilled in the destruction of great trees, but without the power to produce even the tiniest sapling, came with axes and saws and soon the giant lay dead. The product of a century's work of sun and rain, and all the patient arts of Mother Nature, was thrown on the dump. Not even the dignity of utilization was accorded its sound and massive trunk. Now as its friends pass by, morning and evening, they glance at the space left desolate, and in their hearts is a sense of hopeless loss.

Even the heathen of early times worshipped the oak, and though we have discarded their superstitious beliefs, it would be well if we retained something of the reverence that the men of old bore for the trees. Even as that ancient profaner of the groves was punished by unending hunger for his evil deed by the powerful friend of the desolated Dryades, so may we, if we fail to cultivate our love for the beautiful, and persist in our greed and ignorance, perish by starvation from the earth.

MENTZELIA

The Evening Star of the Western Sage

by Harvey E. Stork

HAVE you ever circled a hill at the end of a hot, dusty, desert day, and seen stretched out before you a galaxy of large, white-flowered mentzelias, blossoming forth among dry sedges and stiff moving grasses?

The ruddy sunset skies dye the far-off dunes a deep purple. The dazzle of the sand sinks to a warm glow. And like stars of evening the mentzelias shine forth in the twilight, nodding gracefully with the light wind sifting down the arroyo, and catching faintly on their white petals the pink of the western horizon. A cool, long drink they are to the tired senses, after a long day.

They are like cactus flowers, these mentzelias, and somewhat related in a cousinly way, but the night-flowering cereus resembles them most closely. Some of the many branches of the family are quite small-flowered, while others have yellow blossoms. But if you lean over the large white-flowered plant, you may smell a delicate fragrance, which perfumes the dry air.

I tried to photograph this night-flowering desert plant when the first twilight was on the sage and dunes, and hot, glaring skies filled the west. But the breezes of evening, blown up by the quick-cooling sands, moved the stately stems. It was useless to try the day-time, for the plant then is insignificant, with large petals all neatly folded up and tucked in.

I bethought myself to rise early in the morning to catch the plants when all was still. In the quiet of the sunrise I walked the mile to the field. But every flower, so sparkling and gay during the evening, was now tightly rolled into a long white tube. Sleepy heads! Tired out from their debauch of display the night before!

LIKE THE CACTUS

And more like the night-flowering cereus is this white blossom that graces the western plateau

But I had misjudged the flowers, I found,—they did not stay out all night. By eleven o'clock each fellow was safely curled up. They just slept late, that was all. Later I found out why the evening was their day,—they opened to entertain the moths that fly early in the night, and who, in exchange for some sweetness, transport their pollen over the western plateaus. The flowers soon pass, however. For, only four or five nights they grace the twilight.

Mentzelias foil gardeners in their attempts to transplant them. Or perhaps the plant, with something like an artistic instinct, refuses to dwell away from its natural surroundings where, in the evening, it sheds its cooling whiteness over the heated, burning land.

AT SUNSET

These flowers nod in the wind, while the drab grasses and sedges fade in the purple gloom

NATURE IN PRINT

Mr. Sass' Latest

None has done more in telling of the beauties of the Carolinas, their birds and mammals, their flowers and trees, their lowlands and highlands, than Herbert Ravenal Sass. In his outdoor fiction with a Carolina setting and in his delightful essays, Mr. Sass has made a distinct contribution to southern literature and, at once, to contemporary writing. Now from the presses of Doubleday, Doran comes his latest book, *On the Wings of a Bird.* It is a collection of sketches of the Carolina woods and swamps; unrelated essays, charming in their separate entity and in their combined effect. Mr. Sass is a rare combination of naturalist, writer and poet. His is no mere spinning together of words; the warp and woof of his literary cloth are of strong, enduring fibre. There is a fundamental thought behind his work which he indicates in his preface when, speaking of this latest book, he says: "The utmost that can be hoped for it is that it may help in some small measure to bring nearer the day when man shall cease to be a destroyer and shall become instead the friend and protector of his lesser kinsmen—the guardian and preserver of that marvellous life of earth and air over which, in the course of long ages, he has achieved almost absolute power."

We heartily recommend *On the Wings of a Bird.* R. W. W.

Holiday Pond

We receive frequent requests for suggestion of good Nature books for children which are at once entertaining, accurate and intelligible to youngsters. The number we can recommend is not legion. There are various excellent textbooks, but for the younger children there are few books which can be counted on to entertain and yet give good natural history. We are glad, therefore, to welcome *Holiday Pond* by Edith M. Patch. This is a group of ten attractively written and presented stories of a little lake and what is found within it and on its borders. Miss Patch writes with authority on natural history and has the happy faculty of being able to do so in a way to reach the youngster. The book is published by Macmillan and sells for two dollars.

Wasp Witches

Edward G. Reinhard has a way with him when writing about insects and, particularly, wasps. His story of Madame Pemphredon in a recent issue of Nature Magazine aroused comment on both the interest of the subject and the way that the story was told. This same charm Mr. Reinhard has brought to his book, *The Witchery of Wasps,* just from the presses of the Century Company. It is the story of the solitary wasps and delves in a fascinating way into places hidden from most of us. The volume is listed at $2.50 and is delightfully worth it.

Ants, Bears and Wasps

For years Sir John Lubbock was a painstaking observer of the life and habits of the social hymenoptera and has, with equal care, recorded his observations in a volume entitled *Ants, Bees and Wasps* that E. P. Dutton and Company has published in a new edition based upon the seventeenth edition. Sir John knew insects in such a way as to place himself in the front rank of entomologists and his book has been a classic in this field for a half century. The new edition sells for $3.75.

On Atlantic Fishes

Another volume is added to the group of Field Books of G. P. Putnam's Sons in the *Field Book of Marine Fishes of the Atlantic Coast.* It is the first comprehensive pocket-sized book on marine fishes of this region, covering the waters from Labrador to Texas and is designed for the use of both the angler and the naturalist. From our observation this is a much-needed volume. It is well illustrated with line drawings, halftones and color plates and sells for five dollars.

Plant Pioneers

Who discovered capillary action in trees? Who named the flowers or worked out the tremendous system of genus, species and variety? The answers to these and other questions are found only in the lives of the great blazers of plant trails who spent their lives in whichever country they belonged on the field of botany. As Carlyle said, history is the biography of great men. Ellison Hawks, a fellow of the Royal Academy of Science, and his collaborator, the late G. S. Boulger, hunted through thousands of old manuscripts in many languages, spent long days of research, to compile in one book a more or less complete list of these old students, their achievements, their findings, and the Macmillan Company, New York, has published it under the title of *Pioneers of Plant Study,* at $4. It is a scholarly piece of work, dealing as it does not only with biography but also with myths, superstitions and traditions of the ancient world, and makes a valuable addition to the background of botany, about which too little is generally known.

How Forest Rangers Range

The Ordeal of Brad Ogden, by Arthur Carhart, may be called the saga of the forest ranger, back in the vicious days when men were men and every rancher wishing to graze his sheep and cattle on national forest land shot to kill. It has a love motive, too, that does not impede the action. One gathers that life was rather precarious when it involved guarding the trees of Uncle Sam, with guns popping on every side and a new conspiracy every seven and a half minutes by the village clock. A sigh of regret will probably ooze out of the reader as he finishes and contemplates that the romantic past is gone—all rangers do now is fight forest fires and ride in airplanes. The book is published by J. H. Sears and Company, New York, for $2.

A Valuable Source Book

The latest addition to the "Enriched Teaching Series" of source books on various subjects, designed for use of teachers and published by Teachers' College, Columbia University, is *Enriched Teaching of Science in the High School,* written by Maxie Nave Woodring, Mervin E. Oakes and H. Emmett Brown, all of Columbia University. It lists organizations, businesses, and publications that distribute material, lantern slides, equipment and supplies, pictures, posters or charts to the schools either free or for a consideration, outlines sources of plays, information on clubs and different projects, lectures, tests; and contains a valuable bibliography and periodical directory. Other source books are in the making. Its price, unfortunately, is not known to us.

On Catching Beauty

Perhaps not exactly inspired, but without doubt inspiring to a number, are the poems of James L. Hughes, the best of which he has now collected in one volume, entitled *Life's Glories,* published by the Stratford Company, Boston, at $2.50. They are shot through and through with optimism, joy of living, and kindly spirit. There is a section, "In Nature's Temple Shrines", that Nature lovers will like to look over.

Other Books

Children, Meet the Birds. A bird book by Mary Kendall Hyde for youngsters; written to instruct, amuse, interest and inspire children in the field of ornithology and a knowledge of the commonest birds. The Stratford Company, Boston. $2.00.

The Saint Bernard. Another dog handbook published by the Judy Publishing Company, Chicago, and written by Gottlieb Zulliger, who knows his Saint Bernards. Price, one dollar.

Mosses with a Hand-Lens. Third edition of that excellent guide by A. J. Grout. A volume which should be in the hands of everyone who wishes to track the wily moss to its lair and identify it. Published by Dr. Grout and available from him at 1 Vine Street, New Brighton, New York.

The Mascot Goes Across. A lively book for boys and others by E. E. Stanford, Professor of Botany in the College of the Pacific. Don't be afraid of his title; it's a good yarn. The Century Company published it and says two dollars, please.

The Role of Research in the Development of Forestry in North America. The title is descriptive of an important contribution to forestry literature written by I. W. Bailey, Bussey Institution, and H. A. Spoehr, Carnegie Institution, and published by Macmillan. Price $1.50.

Lizards. An excellent pamphlet for the school by Charles Lincoln Edwards, Director of Nature Study at Los Angeles. Published by the City of Los Angeles.

World Geography. A directed study guide for Knowlton's Introduction to World Geography has been published by Macmillan for forty-eight cents. Worth library room.

"Nunas" and "Noonas"

Indians Love Their Roots and Palefaces Their Flowers

by Leslie L. Haskin

PERHAPS they might be called the "King of the East", and "Queen of the West",—these two flowers. They are remarkably different yet have much in common, for each has been supreme in its own domain, and each is a royal member of its own race.

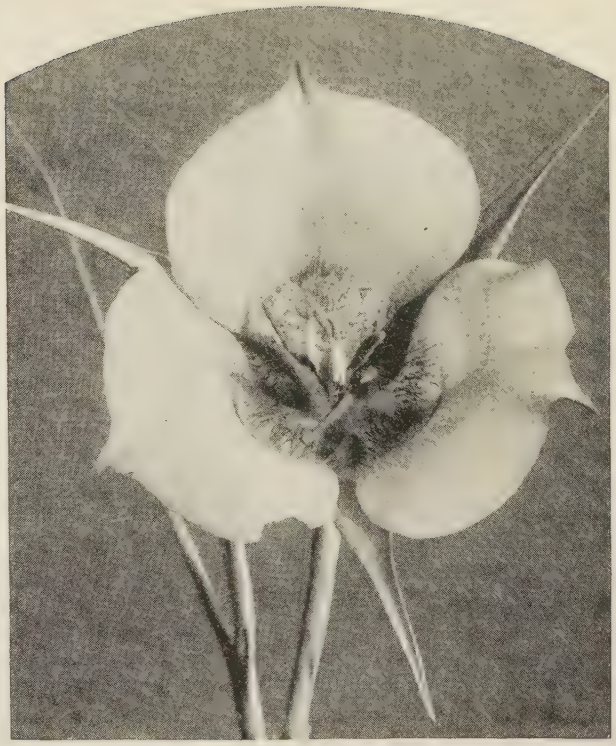
The first is the "big potato" of the Senecas and Iroquois, who adopted its ropes of bead-like tubers as tribal totems. Its Cherokee name is "nuna", altered among the Omahas to "nu nu", and its roots were eaten and highly prized by every native tribe in the East. This is a unique species, in that it is almost the only native plant found within the territory comprising our northern states that was cultivated by the Indians; all others,—corn, beans, squashes, and tobacco,—were introduced from more southern climes.

It was also grown for food by the early settlers of the East, who learned its virtues from the Indians, and it still would be grown had not the so-called Irish potato, much more prolific, crowded it out. In quality its tubers are extremely good, being very dry and mealy —a virtue that only after centuries of culture the best Irish potatoes have gained.

The botanical name of the nuna is *Apios tuberosa,*

"KING OF THE EAST"

The "big potato" graced many an Indian feast, before the prolific "Irish" rival arrived



"QUEEN OF THE WEST"

The "sage-lily" or "noona". Did Indian or white explorers name it from the eastern "nuna"?

although popularly called the "ground nut" by those who have rejected the Indian sobriquet. At the present day it is extensively grown by some flower-lovers for ornamental purposes.

So much for the "King of the East"; now let us turn to the "Queen of the West", which is a lily of the mariposa type. In beauty it can not be surpassed by any flower, and we have Scriptural record that no king was ever clothed as wondrously—"For even Solomon in all his glory was not arrayed like one of these". The botanical name of this plant is *Calochortus macrocarpus,* but as its favorite habitat is the sage-brush country, it has become popularly known as "sage-lily", also the "green banded mariposa". By a strange coincidence, if such it be, it is known among some Indian tribes as the "noona", a name so much like that of the eastern "big potato" as to cause wonder. Did some adventurous eastern Indian, in ages past, force his way almost to the Pacific, and finding the roots of this strange lily so sweet and palatable,—reminiscent of his well-beloved eastern food,—give it its name? Or did some early explorer who had lived among the eastern Indians and knew their food, taste this western bulb and call it "nuna", thus setting the practice for the imitative in aboriginals of the West?

The "noona" was not cultivated by the Indians. No plant save the mystic, virtuous tobacco was ever actually planted by the natives of the Northwest, but they loved the roots of the sage-lily well, and sought it out wherever it grew. Its plump and starchy bulbs, sweet even when raw, and rich and nut-like when roasted, were a rare delicacy for them.

Although never grown for food, this plant, like the "nuna" of the East, is becoming popular as a garden flower. It is better known in Europe, where it reigns as one of the finest lilies of the land. May it prosper well.

NATURE NEWS AND Views

The Last Heath Hen

One of the last heath hens, perhaps the sole survivor of his race, walks the heaths of Martha's Vineyard Island, Massachusetts, in solitary grandeur, but lonely for a mate that never will come. He flies into a tree, and "booms" in the characteristic fashion of the nuptial dance, inflating his orange-colored sacs, erecting his tail and spreading his primaries against his body—but there is no response. Nor can any mate be found for him, though liberal rewards have been offered by naturalists for the discovery of other heath hens. Alfred O. Gross, Professor of Biology at Bowdoin College, believes as a result of his last census taken on the island that when this heath hen dies, the species will have passed forever. Every effort is being made to protect this one bird as long as possible, in the faint hope that a female will turn up before it is too late.

As to Bird Day

Recently we carried a note commenting on the desirability of a National Bird Day, at the time failing to recall that already yeoman service had been done in this direction by the Liberty Bell Bird Club under the auspices of *The Farm Journal* of Philadelphia. Since 1914, Mr. Charles P. Shoffner has been working through the agency of the Club for Bird Day, and the second Friday in April was the date selected. This year the Day was officially proclaimed by eleven Governors and was celebrated unofficially in every State. In view of this accomplishment there seems little reason for effort to establish a National Bird Day and every reason for bird lovers to lend their support to assuring that the date already selected is established and adequately observed as Bird Day in every State.

The Warrior

You who have gaped open mouth at the story of Thermopylæ, or rolled your eyes at Horatius at the Bridge, list to even a better story of bravery among the weak, and the ignominious retreat of the strong. A mocking bird family took up abode near a cottage, according to John W. Bulla, of Miami Beach, Florida, and life was happy until one day when a cat came around. Then the amiable comedian became a fighter. "There was a rasping, screeching battle cry, a flurry of swift wings, and tabby felt her long tail nipped and nipped again," writes Mr. Bulla. "In and out, here and there, like a trained boxer, this dauntless little fighter struck whenever he saw an opening. Defense was futile against such a skilful adversary". So the cat retreated, "but not in very good order, for her relentless little foe kept boring in and did not desist until she was well off the premises. Then with a final victorious screech, the gallant warrior returned to his rôle of rollicking, singing comedian, strutting his stuff for the entertainment of all."

Seasons for Killing Doves

We greatly regret, for several reasons, to report an error in the note in the July number, page 58, under the title *Nesting Mourning Doves Suffer*. Here we stated that Georgia was not yet committed to the so-called split season, which authorizes the killing of the birds during September, when many of them are still nesting. This statement is no longer true, for since the note was put in type the State of Georgia, unwilling to be left behind in such matters, has arranged its own shooting season so as to take advantage of the privilege already enjoyed by her sister states under the Federal Regulations. We note further, however, that in Mobile and Baldwin counties, Alabama, which comprise the southern extremity of the State, "to take care of peculiar existing local conditions", the three months open season on doves does not begin until the first of November. We would be interested to learn just what peculiar local conditions are responsible for affording the doves nesting in these counties relief from persecution at a season when their companions in neighboring areas are being sacrificed.

We shall be glad to hear from any of our readers in the South or elsewhere regarding any aspect of this situation. Frankly, we are a little prejudiced in favor of mother doves and their nestlings.

Dr. Britton Resigns

After more than three decades of distinguished service, during which the New York Botanical Garden has flowered from an idea to its present position as one of the three great botanic gardens of the world, Dr. Nathaniel L. Britton, its Director, has tendered his resignation. Arrived at three score and ten, Dr. Britton now wishes adequate time to devote to private research, particularly in the field of tropical vegetation. We wish him all success in this work.

Plant Registration

The monumental task of national plant registration is to go forward at once, as a prelude to international registration, under the organizing leadership of the National Association of Gardeners, with offices at 522 Fifth Avenue, New York City. A National Horticultural Council will be established, consisting of one member from each interested horticultural organization, to arrange details for the local listing of the endless number of varieties established in all parts of the country. Helpers will be welcomed.

Federation Conservation

No stronger friend of conservation exists than the General Federation of Women's Clubs, and at the Biennial Council held in June in Swampscott, Mass., where reports were read of the year's activities, it was proved that the Federation was no mere silent partner in this field. The chief work seemed to be in the field of forestry and tree-planting, notable progress being made, and many state leaders told of efforts to create state parks or further beautify those in existence. Among the resolutions passed was one pledging support to plans for making Great Falls, on the Potomac River at Washington, a park, and preventing its exploitation. Mrs. C. C. Marshall, chairman of the Committee on Forestry and Natural Scenery, presided over the conservation meeting in the absence of Mrs. Tippetts, the conservation chairman, and Mrs. Whitley, chairman of Conservation of Natural Resources.

Bird Convention Meets

The first convention ever held by bird students of the states of Iowa, Nebraska, Minnesota, and North and South Dakota took place early in May in Sioux City, Iowa, under the auspices of the Iowa Ornithologists' Union, the Nebraska Ornithologists' Union and the Sioux City Bird Club, and resulted in the election of Walter W. Bennett as president of the Iowa group, and Miss Mary St. Martin, of Wahoo, as the leader of the Nebraskans. Following the business meetings, delegates proved their bird-spotting abilities by discovering 112 different species on a field trip near Sioux City. The convention in 1930 will probably take place in Omaha.

Nature Country Club

A Nature country club, where "you may name the wild creatures without a gun and leave the wild rose on its stalk for later comers; catch a trout for breakfast; pick the wild and cultivated fruits; in the spring make maple sugar; in winter, hike, read the "snow signs", skate, ski, coast and toboggan", is being planned for people "who are on friendly terms with themselves, their fellowmen and the world of Nature" by George Wilton Field in Sharon, Massachusetts. The club will be a 250 acre farm within one hour of Boston and Providence, R. I. The fees will be nominal, members paying as they go during their stay at the "club". Mr. Field will send further particulars regarding this novel idea on request.

Wild Life Protection

The Eleventh Annual Session of the American School of Wild Life Protection meets in McGregor, Iowa, August 5 to 17, with a remarkable program for the Nature Lover. Full details may be obtained from Mr. F. G. Bell at McGregor.

Bird Gratitude?

A boy with better aim than ideals shot own a cardinal grosbeak in the yard of a hool in Pittsburgh, Penn., and J. S. Fruit, e principal, at the plea of his school ildren, went to every room with the dead rd in his hand and delivered a funeral ration worthy of Antony over it, and a hilippic against its murderer. That night, hen he went home, he found two cardinals ying to decide whether or not to build n his porch, and while he was standing ithin six feet of the birds, the male per-uaded the female to take up abode in the ines. The birds built a nest and raised eir young, much to Mr. Fruit's delight. nd now he is wondering if there is a ird system of radio, or if it is just a mere oincidence that kindness was repaid.

Fort Keogh Refuge

An executive order by President Hoover as established a 57,000 acre sanctuary for irds on the site of the former Fort Keogh ilitary Reservation, near Miles City, ontana, to be known as the Fort Keogh ird Refuge. The land area is inhabited rincipally by sharp-tailed grouse and ring-ecked pheasants, and a 70-acre artificial ke within the area will be an important esting place for the migrating waterfowl nd other birds that visit the refuge.

Making Naturalists

If John Burroughs were alive and were sked the two chief characteristics essen-ial to a naturalist, he undoubtedly would nswer—powers of observation and of in-erpretation of what is seen, and the atience to write down all facts learned. hese are acquired traits, however, that nyone really interested in Nature can evelop by beginning young, but too few oungsters get the right start. Keeping a otebook may seem like hard work, but nce it is begun and the observations pour n, it becomes an object of pride, and the rudgery falls away. If Nature Magazine ere to run a contest for the best set of ature notes collected by boys under fif-en, Windsor Lewis' note book would have o be considered for the prize. Windsor is n years old, and spent last winter in Cali-ornia and Colorado. His eyes went every-here, and so did his camera. On getting isure time, he carefully wrote down what e had learned, dividing his acquired knowl-lge under the subject heads of bushes nd trees, mammals and reptiles, and birds. ere is just one of his observations: "(6) *he Road-runner.* A large bird with a long il. It is about two feet long from head to ne tip of the tail. When it runs its tail oes up and down. Its chief foods are: zards, beetles, centipedes, grass-hoppers, ice, snakes, horned toads, and birds. In her words, practically anything. I once atched a Road-runner catch, kill and eat s sparrow. When I walked up to him he icked up what was left of the bird and n away with his tail wagging." Of such uff as Windsor Lewis are naturalists a ade. And we feel certain that there are undreds of other lads who, once they had ie out Windsor's methods of seeing an l ding, would get a kick out of this form outdoor sport.

Gorgeous Springtime Blooms

SHUMWAY'S "Pedigreed" Bulbs

If you want a beautiful springtime garden, plant bulbs this fall. Shumway's "Pedigreed" Bulbs are imported direct from Holland; guaranteed largest sizes, first quality. You can't fail to produce tulips of gorgeous beauty. Make your selections today at our low prices. Delivery charges prepaid anywhere in the United States.

Superfine Mixture—Largest Size Bulbs

100	Darwin Tulips	17 Varieties	$ 3.50
100	Breeder Tulips	15 "	4.00
100	Cottage Tulips	12 "	3.75
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100	Crocus (1½" dia.) . .	5 "	3.00
100	Hyacinths	10 "	13.75
100	Crocus (1¾"—2" dia.)	5 "	3.75
100	Narcissi, U.S. Grown . .	5 "	8.75

50 Bulbs at the 100 rate.

Extra Special—12 Louis XIV Breeder Tulips, Purple, Gold Margin, 90c; fifty for $3.50; 100 for $6.25

All varieties grow 2 to 3 feet tall. Giant bloom.

100	Princess Elizabeth	Rose Pink	$ 4.75
100	Baronne Tonnaye	Vivid Pink	4.25
100	Bartigon	Carmine Crimson	4.25
100	Clara Butt	Salmon Pink	4.25
100	La Tulipe Noire	Nearly Black	5.00
100	Valentine	Violet	5.00
100	Scarlet Beauty	Scarlet	5.00
100	Inglescombe Yellow	Yellow	4.25
100	Golden Bronze	Name describes it	4.75
100	Farncombe Sanders	Rose Scarlet	4.50
100	Rev. Ewbank	Lilac-blue base	4.50
100	Cardinal Manning	Rosy Violet	4.75
100	Dream	Delicate Lilac	4.75
100	Pride of Haarlem	Carmine Rose	4.25
100	Mme. Krelage	Lilac Rose	4.25
1500	bulbs—100 of each		62.50
750	bulbs— 50 of each		32.00
375	bulbs— 25 of each		16.50

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121 So. First St. *Established 1870* **Rockford, Ill.**

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HINTS *and* HELPS *for* HOME *and* GARDEN

THERE are things to do in August. Gardening is on the up-and-up. As many activities as there are thunderstorms must be carried on. Fall bulbs must be ordered, if they are not already on the way, and the ground must be prepared for them. Evergreens must be planted, and a few hardy, fast-growing perennials. Seeds must be collected from the strongest and most beautiful of the annuals and perennials. And, in addition, the entire garden must be kept in order, free from drought and weeds, and protected from sudden wind and hail storms. This is no time to weaken.

* * *

Coreopsis, sweet williams, hollyhocks and gaillardias may be planted now. Other perennial seeds will survive in a cold-frame, which is one of the handiest affairs to have around. As for the annuals, a number of varieties make stronger plants and bloom earlier and more profusely if sown now or in September than if planted in the spring. Among the hardy ones are: calendula, calliopsis, candytuft, cosmos, dianthus, larkspur, lupine, petunia, phlox, sweet pea, and verbena. Forget-me-nots, primroses and bellis perennis likewise are ready to go in the seed beds, or find a place amid the plants already blooming. See that seedlings of perennials are kept shaded, however. A cheesecloth or board frame will do the trick. And keep the plants moist.

* * *

One of the August tasks that tries your soul is keeping the tops of annuals clipped off. The monotony of snipping scissors is worse than boring visitors. But chrysanthemums, geraniums, carnations and others will repay by winter-flowering. Then there is old wood to cut out of the currant bushes, cuttings to take, geraniums to cut back severely, and phlox to cut down for late blooming,—and climbing roses to prune. This might be called the Month of Shears and Knife.

* * *

To prune climbing roses, cut out the two- and three-year-old wood from such Polyantha varieties as crimson rambler, Hiawatha, Dorothy Perkins, Excelsa and Lady Gay, and train in the new. Hybrid teas and wichurians are not treated so severely, and just the side twigs should be removed from the main shoots. This work should be done as soon as the flowers have passed, as it gives the new wood opportunity to become better developed before another year.

* * *

Oriental poppies stand transplanting better now than at most other times of the year. The roots are perfectly dormant. The old scarlet poppy, still a standby, has been surpassed by many new varieties, and a good collection should include Beauty of Livermore, May Sadler, Mrs. Perry, Perry's White, Apricot Queen, Brightness and Grossfurst. They should be mulched with straw the first winter after planting to prevent heaving which is always disastrous.

If you are one of those energetic individuals who maintain a vegetable garden along with a flower plot, you may be tempted by the fact that Chinese cabbage, kale, mustard, summer radish, spinach and turnip will still be able to beat out the seasons, and furnish delectable fall dishes, if put in the earth now.

* * *

A compost pile is simple enough to make, and when you are not bothering about other things, these hot days are ideal for adding to it. Collect all the vegetable matter available,—weeds, leaves, dead plants, strawy manure,—and spread out on a vacant plot to a depth of about six inches. Then sprinkle over with lime to aid decomposition. Spread over this soil about two inches thick, then add a thin layer of sifted cinders. Then another layer of weed and leaves, and more lime, soil and cinders. The sky is the limit. If your situation admits this, there can be disposition of certain types of garbage that will yield a profit in the spring when fertilizer is needed, and soil cries for enriching. Separate from the compost heap, if you have the room, there should be the leaf-mold heap, where all fallen leaves should be saved and converted into this valuable commodity. If there be a natural hollow, the moisture that collects there will aid the process of decomposition. The craze for burning leaves has resulted in a wastage that is beyond calculation. The addition of some ammonia sulphate to the mass will aid in the task of converting a bothersome liability into a valuable asset.

* * *

Many prefer to plant lawns in the fall, and though Bulletin No. 40, issued by the American Nature Association and sent on request, gives in brief form the benefit of the experience of O. B. Fitts, consultant for the greens committee of the U. S. Golf Association, yet the more complete book just written by F. F. Rockwell should be a part of every garden library. The book, the latest of the Home Garden Handbooks, published by the Macmillan Company and sold for $1, discusses the place of the lawn in the landscape, what seeds to use, how to build a permanent foundation, how to kill off weeds and grass diseases, how to care for the lawn tools, and how to fertilize. You can't be unsuccessful after trying Mr. Rockwell's methods.

* * *

While thinking of lawns, don't forget to readjust your mower, so that it will not cut too close. And soak the lawn well and frequently, after the sun has gone down, to prevent burning.

* * *

Gardening, in this day and age, is not restricted to the country, but even the apartment dweller in crowded cities can work off his horticultural urge. Miss Ida Mellen, aquarist at the famous New York Aquarium, has tried out roof gardening and incorporated her findings in a book on the subject, published by A. T. De LaMare, Inc. *Roof Gardening* tells all about preparation for an aerial flower plot, advises on what bulbs, seeds and tubers are best suited for varying conditions, enthusiastically recites the joys you may expect from April to November, and ends up with an enticing list of the popular meanings of numerous blooms which may reward your efforts. Miss Mellen's optimism is such that we are thinking of selling the house and lot, and getting one of these cooperative apartments right down town.

* * *

A new and noteworthy shrub which may be added to the list for next year is *Kolkwitzia amabilis,* recently given the common name of beauty bush. This was brought from Hupeh, China, some years ago by E. H. Wilson. It has a mass of delightful pink flowers in June that somewhat resemble snap-dragons on arching, twiggy branches. Only a few nurseries list it, as yet, but it seems destined to become widespread and popular.

* * *

All of the dried flower heads should have been clipped off the lilac bushes by the first week of the month. Incidentally, a very interesting comment on this plant comes from Miss Emily R. Sugden of Windsor, Conn. She writes that in New England, it is an accepted fact that a lilac will not bloom before it is seven years old, but she has seen a New England scion transplanted to Southern California that brought out its delicate purple flowers the next season.

* * *

A word about spraying. The insects seem to think that it is their garden you are making, and the game is to frustrate them. It is a question of life and death for them, and spoiled efforts for you. Study your enemies, find out what kind they are, then work intelligently. There are chewing insects, like the potato beetle or codling moth, which can be killed by spreading paris green, or arsenate of lead within their feeding range. The sucking insects have probosces which they sink into the tissues to suck out the sap and thus escape poison spread on the surface—only contact poison can touch them. Fungus is the greatest cause of plant diseases, spreading rapidly as it does by its spores, and developing networks of food-gathering hyphae weakening and destroying the plant. Commence the spraying before the disease has advanced, and spray thoroughly. Half-way methods will not succeed.

Free Air

Housewives and others who have wept when the goldfish died perhaps will be amazed at the tale of H. E. Jaques, of the Department of Biology at Iowa Wesleyan College, regarding the goldfish who lived more than six months in a hermetically sealed jug, and liked it. He reports the experiment:

"Can a fish live without air? Can it get along and thrive hermetically sealed in a glass jug? The saleswoman from whom the little goldfish was bought for this experiment strongly objected to putting the cover on the glass fruit jar used to carry it from the store, thinking it would suffocate before the owner could reach his home. Yet from January 8 until well along in September this two and one-half inch fish lived its happy and independent life permanently sealed in a gallon glass jug about half filled with water. With the cork wired down and the mouth of the jug covered with sealing wax, the little gold fish received no attention or care.

"But how was it done? The folks at the Biological Laboratory called it a microcosm or little world. The jug was filled to the depth of an inch with dirt from the bottom of a pond. It contained many minute living things. The jug was then filled with pond water to the half-way point. In this water were placed a number of small aquatic plants, and therein lies the secret, for in that little world the plants and fish lived a type of cooperation that the big world around it might well pattern. Any daylight hour, particularly when the sun was shining on the jug, one could see streams of minute bubbles rising from the plants to the surface of the water. The bubbles were pure oxygen released by the plants in their food building. The food of plants consists almost entirely of water, which in this case is all about them, and of carbon dioxide, a gas which is continually being given off by the fish and dissolved in the water. The plants build these two substances into starches, sugars and other forms of cell tissue but in so doing have some oxygen left over which is released. It is this supply of oxygen which the fish used and thus kept alive. For food the fish ate some of the minute animal life living in the mud. Neither the plants nor the fish could live successfully for a very long time without the other.

"It is an interesting experiment which any one may try. And as for the fish; it lived longer and got along better than most of the goldfish which receive solicitous care."

Trees and Men

Pennsylvania Legionnaires who have cases of arrested tuberculosis are to help care for the one million acres of public timber land and regain their own health as a result of a plan worked out between the Keystone State and the American Legion recently. Two cabins have been built as forerunners of several more in the high altitudes of the state timber land, and the Legionnaires will live in these, one being in the heart of the Poconos, and the other in the Tioga forest. As 2000 cases of tuberculosis among World War Veterans are reported, such a worthwhile scheme merits all encouragement, and perhaps other states will follow.

RARE BARGAINS FOR FLOWER LOVERS

Pfeiffer grown perennials take first place as prize winners because developed by flower specialists. To introduce Pfeiffer quality, we offer wonderful collections of popular and rare varieties.

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25 CHOICE VARIETIES $1.35

Surprise collection 25 choice varieties, not labeled, wonderful assortment colors, all different, called surprise collection because it will surprise you. Postpaid, $1.35.

17 Most Popular VARIETIES $2.50

Kinds that sell usually from 25c to 50c each which means some of the rarest and finest grown, all natural, all different, colors unequaled by the Rainbow, collection easily worth $5.00 our special price, $2.50 postpaid and one Famous **Mother-of-Pearl Iris, FREE.**

free COMPLETE CATALOG —of Iris and Peonies containing full description of these Bargain Collections and other unusual Bargains of all the most famous varieties grown. Hundreds of rare varieties listed with their ratings, also other special prices on Tulips, Gladioli, Phlox, Perennials, etc. Don't overlook the free Iris and Peonies that we are offering with most of the collections in this advertisement, which makes these Bargains the greatest we ever offered—and, we believe, they are by far the best offered by anyone.

PEONY BARGAINS

6 Wonderful Peonies $2.00

Our selection, 6 dependable varieties. Extra large divisions. Two red, two white, two pink, each correctly labeled, the six for $2.00 postpaid and if you order before September 15th, you get a **Richardson's Rubra Superba,** worth $1.00, **FREE.**

3 Famous Varieties $2.50

Highly rated famous varieties, Red, Pink, White, easily worth $3.50, our special price postpaid $2.50.

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12 CHOICE PLANTS $2.50

Three each of a red, pink, salmon and white variety. Large, full colored clusters. Extra hardy. 12 beauties for only $2.50, postpaid.

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PRICES LOW SUPPLY LIMITED

Pfeiffer advises every flower lover to order Tulips early, as prices are rising. Pfeiffer Tulip prices are low but supply is limited.

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READY IN SEPTEMBER

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A superb assortment—3 each of 9 varieties—27 bulbs in all $7

L. elegans—orange red; L. hansoni—yellow; L. croceum—golden yellow; L. regale—white, shaded pink, inner surface primrose yellow; L. superbum—bright orange; L. candidum—pure white; L. bateman-niae—apricot; L. speciosum rubrum—red; L. tigrinum—reddish yellow. Catalog free with order.

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No Soil—No Water—No Care

Each bulb produces from 6 to 15 flowers. When the blooms have ceased, the bulbs may be potted or planted in the garden or lawn, where the following spring they will develop a beautiful foliage. You can remove the bulbs from the ground again about July first, dry them in darkness for a few weeks, and use for indoor decoration as at first. Outside of destroying them, it is impossible to keep them from blossoming at their regular blooming time. Order today. Choice bulbs, ***30c each; 4 for $1.00; 10 for $2.00,*** postpaid.

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Home Birding

Bird lovers who see, year after year, young fledgings leave the nest too early only to be gobbled up by some stray cat may take refuge in the suggestion of Norman N. Stenz of Washington, D. C., and his son George. They established a barrel lined with straw on the covered upstairs back porch, and when nestlings are found wandering on nearby lawns, they are taken to the barrel. It does not take the mother bird long to find her children, and she feeds them religiously, while even the most adventurous young one cannot navigate the steep slopes of the barrel to explore. Thus the birds are safe, son George has their company, and tabby keeps her slim, graceful figure.

A Memorial Grove

The memory of Frank D. Stout, former president of the Del Norte Lumber Company will always live in the heart of California. Great forest giants perpetuate his name as a result of a deed of gift to the State by members of his family of 44 acres of redwoods in a most beautiful section of the redwood belt, to be known as the "Frank D. Stout Memorial Park". The tract is on the route to Grants Pass, about 10 miles north of Crescent City.

When Birds Rain Down

Happenings reminiscent of the days when the passenger pigeon swarms swept over the Middle West aroused the citizenry of Holyoke, Colorado, during the night and morning of May 13, when great numbers of birds, varying in size from ducks and horned owls to tiny snow-birds and other songsters stormed through the city, preventing sleep for any by their calls and the rattle of their bodies against buildings and window panes. Hundreds of dead creatures were strewn along the streets, and others, still alive, moved as if in a daze, and could be picked up and handled the next day. Adverse weather conditions, in all probability, had driven these birds, migrants to the North, out of their course, and they became bewildered by the city buildings and noises.

Whale Conservation

In an attempt to stem the increasing slaughter of whales, which has reached 30,000 a year, a Council for the Conservation of Whales has been organized with the support of the American Society of Mammalogists and other groups, Dr. Henry F. Osborn, president of the American Museum of Natural History, announced recently. Members of the council include Secretary Wilbur of the Interior Department, Gifford Pinchot, David Starr Jordan, and Prince Nagamichi Kuroda of Japan. An attempt will be made to obtain international cooperation in the problem. Many species of whales are nearly extinct now, and repletion does not equal depletion under present conditions. In such large mammals recovery from a small nucleus is very slow as only a single young one is born every other year.

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Sod in six weeks! A rich, velvety stretch of lawn that chokes out weeds before they can grow! With proper care no reseeding is ever necessary. You will have a deep, thick, uniform turf that's everlasting and makes your home a beauty spot. That's what you'll get if you plant Scott's Creeping Bent.

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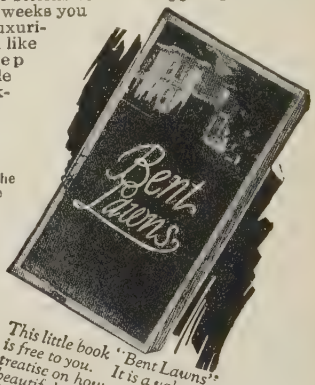
Creeping Bent—long recognized as the ideal grass for golf putting greens—is now producing Super-Lawns. Instead of sowing seed, you plant stolons or the chopped grass—and in a few weeks you have a luxuriant lawn like the deep green pile of a Turkish carpet.

Fall is the best time to plant



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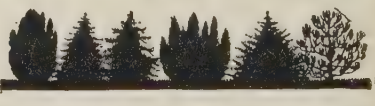

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A handsome tree of rapid growth.
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Rapid grower. Bluish green foliage. Especially good in dry sandy soil.
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Light bluish-green. Dense foliage.
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W. L. GUMM, Peony Specialist
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Sydney's Floral Clock

One of the three floral clocks of the world has been established at Sydney, Australia, through the gift of Sir Arthur Rickard, to match its fellows at Edinburgh, Scotland, and Bridlington, England. The dial is covered with from eight to eighteen inches of soil, on which are planted varieties of Alternanthera, while the two and one-half inch layer of dirt on the hands supports shallow-rooting plants. Another variety of Alternanthera serves for the seven-inch hour numerals. More than sixteen thousand plants are used to dress the clock. The works are housed separately, being connected with the dial by underground connecting rods. And the masterpiece is useful as well as ornamental.

Opening Day

It is opening day of the duck-hunting season among the wild rice, blue flag, reed grass and pond weeds of the marshes some miles south of the city of Albany, New York. Thousands of ducks, teals, mallards and black ducks, the same creatures that had circled in great clouds when the Hudson river boats churned their way past during the summer, were just opening their eyes to the rosy streak of dawn in the east. "A signal shot was heard west of the Stockport flats," writes W. J. Schoonmaker, a witness to the cataclysm: "Immediately a lasting cannonading began. Single barrel guns, double barrel guns, repeating and automatic shotguns showered the flats with lead and in less than one single minute hundreds of rounds of ammunition were shot. Ducks that paddled contented and fearless in an open stretch of water were literally mowed out of existence as masses of shot swept across the surface and those that were not killed or wounded after the first onslaught rose and sped over the marshes to be shot at from every angle by the hundreds of hunters that were concealed in the reeds.

"Hundreds of ducks, some of which had never before heard the roar of a shotgun, flew bewildered, first to the north to be shot at, then to the south to be shot at, then to the east and then to the west,—high, and low,—and still shots rang out. When they rested in the open water of the Hudson river men tried to float within gunshot, and when they flew toward the reeds, men concealed in blinds shot them down. Yesterday a day of peace and contentment, today a day of slaughter and misery.

"Here nothing was safe; everything that flew offered a target for that crowd. Two American bitterns started lazily across the marsh but were soon brought down after dozens of shots were fired at them. Later a pair of Wilson snipe went swiftly over, but after a comparatively long flight, these, too, crumpled and went down, and even the red-winged blackbirds were shot.

"The smoke from thousands of shots hung over the marsh like a mist and the smell of burned powder filled the air. Hundreds of ducks, large and small, some dead and some only crippled, fell heavily into the thick reeds and many were never found. Yesterday they were undisturbed, safe and practically unafraid; today they were shot down without ever knowing why."

PETERSON'S PERFECT PEONIES

IF you are considering buying peonies this Fall which you want to be sure will flower for you next summer, then we certainly recommend that you try our one and two-year roots. These are clumps that have fully developed in our fields from divisions and are therefore ready to go right ahead and give you the maximum amount of bloom in the shortest time.

It is now a quarter of a century that Peterson's Peonies have set a standard for quality and reliability that has challenged comparison. Our annual catalog,

"THE FLOWER BEAUTIFUL"

will be cheerfully sent upon request. In it are honestly described over 100 varieties of the modern peony, and full planting and cultural directions are plainly given to help you succeed in producing blooms of this noblest of all hardy garden flowers.

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Nursery located 2,000 feet from Lackawanna Trail, Pa. Route 2; U. S. Route 611. Visitors welcome at any time.

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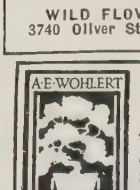

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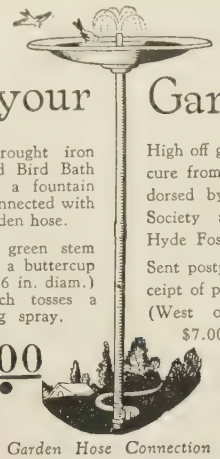

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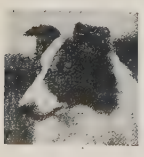

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An Albino Robin

One day, when Miss Justine L. Iddings of Banning, California, was making her way through a thick patch of brush near her home, a flock of robins settled down near her, and with them came what she thought at first was a dove. But her uncle, who was with her, identified it as a robin—an albino, with darker bill and feet, but in all else, perfectly white. He did not seem to mind his lack of color, nor did his companions. "We were carried away by his beauty", Miss Iddings writes: "His plumage was so dazzling in the sunlight that came in streaks through the branches of the high trees, and formed such a contrast with the darkness of the thicket. We never thought of leaving, but watched and watched until the whole flock flew away."

Louisiana's Fur Supply

The Fur Animals of Louisiana, by Stanley C. Arthur, being Bulletin No. 18 of the State Department of Conservation, has recently been distributed. This excellent summary begins with a very interesting account of the early fur trade of North America, with special reference to the Mississippi Valley. There are popular accounts of the various fur-bearers and numerous discussions and tables showing methods of capture, numbers taken, and value. The pelts taken represent in some years a value of more than six million dollars.

The author very properly voices the desirability of so handling this great resource that the stock shall not be reduced, if the contribution of the wild animals to the state's prosperity is to continue. The necessity for this is shown by his figures of the annual catch of muskrats (which a few years ago constituted more than 95 per cent of the total) which has rather steadily decreased from about ten million in 1922-23 to less than three million in 1927-28. While the catch of other fur-bearers has somewhat increased, to those familiar with the situation, this indicates that the muskrats are being over-trapped. This is the universal result where a valuable crop that was planted and nourished by Nature is gathered by an uncontrolled public. Certain large areas of marsh, however, are now owned and controlled, and this holds hope that this great resource will be perpetuated. The Department of Conservation announces that copies will be mailed to persons who send 25 cents in stamps to 126 New Orleans Court Bldg., New Orleans.

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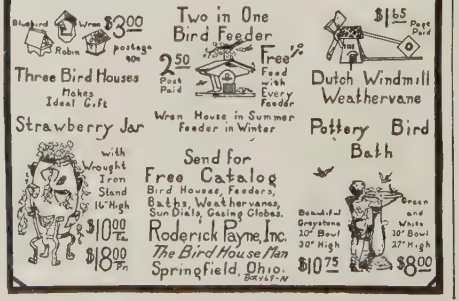

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Value of Jersey Hawks

The Hawks of New Jersey and Their Relation to Agriculture, by Dr. L. A. Hausman, is published as Bulletin 439 by the New Jersey Agricultural Experiment Station, New Brunswick, N. J. A man clad in blue may rob a house, but not all blue-clad men are robbers. Similarly, some desirable birds are killed by hawks, but not all hawks kill desirable birds. But many of our citizens assume that they do, and, consequently, many of our beautiful and beneficial hawks are becoming scarce. This view, briefly, has led our author to prepare this excellent little report on our hawks and their value to the agriculturist.

The method of treatment is particularly attractive. In general a figure of the bird, and a diagrammatic statement of its food, showing the proportion of the different kinds, occupy a page, while on the page opposite are statements of its color and other characteristics, its range in the state, its nesting habits, and its general status. The conclusions are based on much first-hand study by the author, supplemented by the investigations of other competent authorities, and are characterized by fairness of judgment and a sympathetic attitude toward our wild life in general. Noteworthy features of the report include tables giving the call-notes, field-marks, nesting and other habits, habitat, and other points to facilitate identification of the various species. We commend this report to the attention of farmers, sportsmen, legislators, and all others interested in our wild life.

E. A. P.

Vertebrate Zoology

Vertebrate Zoology, an Introduction to the Comparative Anatomy, Embryology, and Evolution of Chordate Animals, by G. R. De Beer, is one of a series of textbooks of animal biology being published by the Macmillan Company, and edited by Julian S. Huxley. The method of approach in the present work is by the consideration of certain species typical of the main groups of vertebrates, and illustrating different stages of organization and the trend of evolution. The types treated are: Amphioxus; a lamprey; a shark; a cod; a salamander; a lizard; a pigeon; and a rabbit. Discussion of these lead to a general history of the chief groups and the climatic and other factors concerned in their development. A final section deals with the affinities and evolution of the human race. The eminence of the author, and of his sponsor, guarantee a very high degree of authority for this work.

E. A. P.

Hardy Blackbird

The rigors of northern Maine winters have no terrors for a certain blackbird which has made his home near the residence of Edward Gilbert in Houlton, Maine, within two miles of the New Brunswick border. Well past mid-winter this bold bird joined a colony of English sparrows and other birds which were fed all winter by Mr. Gilbert and seemed to be satisfied with his newy environment and planning to stay the season through.

The New York State

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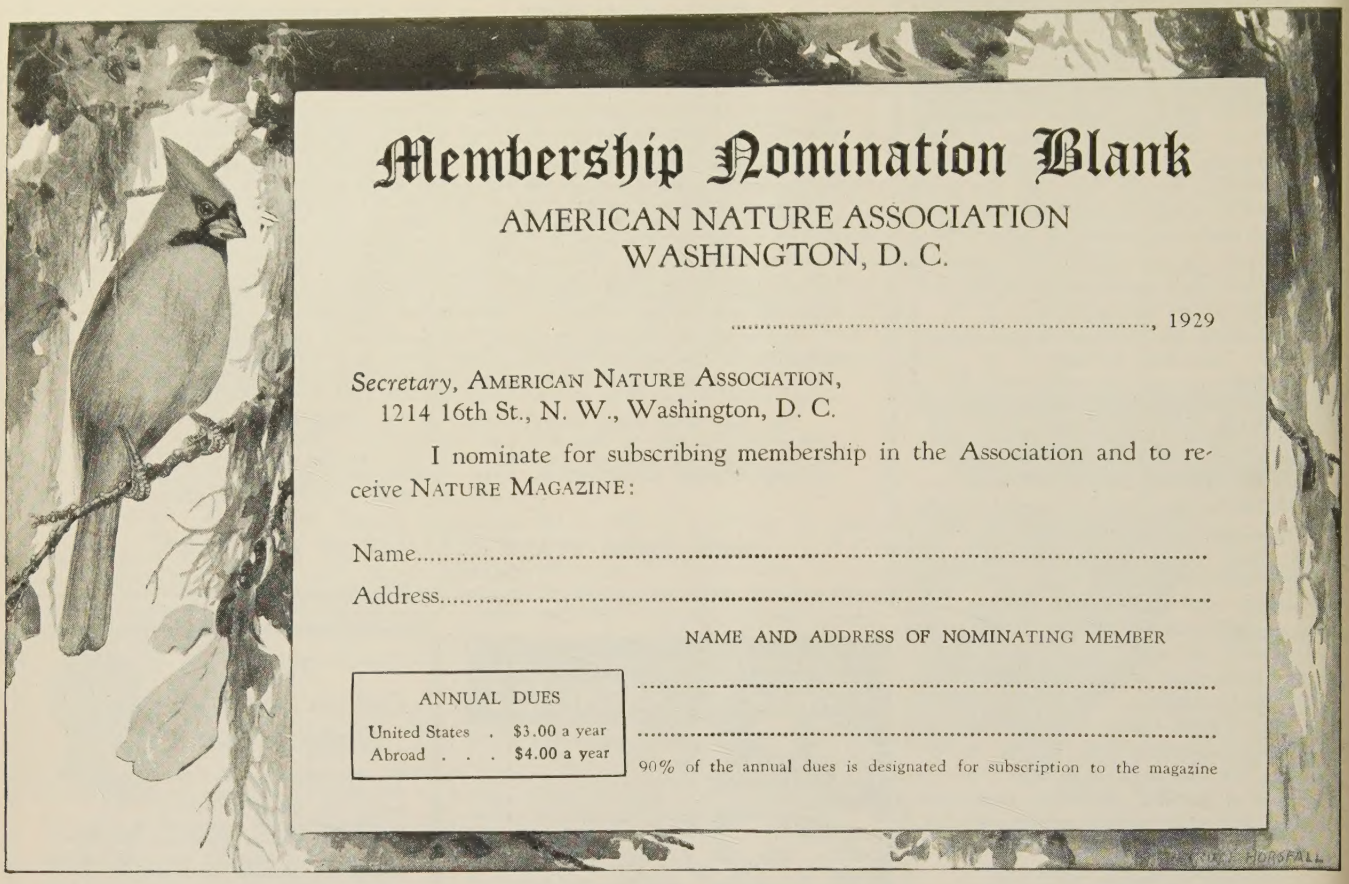

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INDEX TO ADVERTISERS IN AUGUST ISSUE

BINOCULARS

Bausch & Lomb 69
DuMaurier Co. 71
Loring, J. Alden 71
Mirakel Optical 71

BIRD HOUSES

Crescent Co. 126
Winthrop Packard 126

BOOKS

Bird and Animal Paintings 65
Bound Volumes 71
Forestry Almanac 66
Nature Almanac 70
Nature Binder 70
Plymouth Rock Squab 127

EDUCATIONAL

Am. Landscape School 127
Am. School of Photo. 127
Calvert School 127
N. Y. State College of Forestry 127

GARDEN & ACCESSORIES

The Aquaproof Products Co. 124
Burgess Seed Products Co. 124
Dayton Mfg. Co. 70
W. L. Gumm 124
Holland Bulb Co. 125
Horsford, F. H. 123
Hudelson, H. M. 125
R. F. Knight Co. 126
LaBar's Rhododendron Nursery 125
Peterson, Geo. H. 125
Pfeiffer Nursery 123
Scott, O. M. 124
Shumway, R. H. 121
Spring Hill Nursery 124
Western Maine Forestry Nursery . . . 124
White Showers Inc. 125
Wild Flower Preservation Society . . . 125
A. E. Wohlert 125

GIFTS

Gift & Photo Shop 126

HOTELS

Bellevue Stratford Hotel 71
Manhattan Hotel 71

INSECTICIDES

McLaughlin Gormley King Co. 121
Wilson, Andrew 124

KENNELS

Chappel Bros., Inc. 126
Comrade Farm Kennels 126
Loganbrae Kennels 126

LECTURES

Guy C. Caldwell 69
Wm. L. Finley 68

MISCELLANEOUS

Apelt Armadillo Farm 126
Bird-Founte Co. 126
Eden Washing Corporation 67
Everset Trap Co. 126
James D. Lacey 66
R. L. Polk Co. 65
Pronunciphone Institute 127
Ransom Fur Farm 126
Stemmler, L. E. Co. 71

PHOTOGRAPHIC

Amateur Cinema League 69

SPORTING GOODS

Carpenter, Geo. B. 70

TAXIDERMY

Jonas Brothers 126
N. W. School of Taxidermy 127

The American Tree Association stands for a constructive policy of forest protection and extension, to increase appreciation of forests as natural resources essential to the sound economic future of the country.

The Association directs encouragement of tree planting by the public; disseminates popular forestry news for the information of editors of the daily press; and compiles and distributes forestry news and reports on legislative progress for assistance of active foresters in the field.

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"TREES ARE THE BUSINESS OF EVERYBODY" IDA GILBERT MYERS POINTS OUT PART THEY PLAY IN DAILY LIVES OF ALL

THE new edition of the Forestry Almanac published by the American Tree Association of Washington has just come from the press. It includes many features not in earlier editions. It has forestry figures from every state and many nations. In a notable review of the new edition Ida Gilbert Myers in the Washington (D. C.) *Evening Star* writes:—

"The Forestry Almanac is a publication whose purpose is to report progress in every department of forestry work. The edition in hand, that of 1929, is designed to bring the subject up to the moment for the benefit of the public whose interest and whose duty in respect to this matter are personal and imperative.

"Trees are the business of everybody. Every tree is the immediate concern of each of its human neighbors. This point cannot be overstressed. As in so many other worthy enterprises, in this one, too, success depends upon the individual sense of responsibility. No matter how wise may be the plans that are laid, nor how perfect the organization for carrying them through, the best cannot be achieved without the deeply interested and active support of you and me—all the you's and me's.

"By way of introduction, Charles Lathrop Pack, president of the American Tree Association, reports the progress of the forestry from its formal beginnings, half a century ago, up to its status in the present. To this he adds a hopeful vision for the next few years, and beyond. 'These years of up-building have seen, and we still see, the rapid depletion of our forest resources.' But in brighter outlook Mr. Pack pictures the awakening of a more general concern in this vital matter. A great point, that.

"For people generally—men, women and children—seized with a really passionate desire to save the trees, will see that the thing is done, or that it is on the way to a splendid fruition. What better single thing in the way of education could be imagined than for children to learn a true affection for this beautiful thing—a tree—and to devote to it the kindliness and care that spring from every sort of love?

"The Forestry Almanac is a real treasure house. In it one may find useful facts about the subject in hand, as he may find also many a deeply interesting story of tree life, or the life of creatures dependent upon the trees. Here, concisely summed, topic by topic, is the work of the United States Forest Service, coupled with a digest of national legislation in respect to the matter. National and State associations are described in their purpose and activities and achievements. Foreign associations are briefly compared with our own for the commonly conceded benefits derived from such parallelisms and divergencies.

"How to Plant Trees is a theme of wide usefulness to the children everywhere, and it must be kept in mind that the children are a vital point in a program whose support and final fulfillment rests upon them, the men and women of tomorrow. To kindle them with love for the trees today promises a flourishing and useful tree world of the nearing future. Tree holidays are planned and tree highways are described.

"Famous trees are named in high honor, and those that belong to 'the hall of fame' are cited. Summer camps in their effects upon the forests are pictured hopefully, since these camps are becoming direct agents in the preservation of the trees. Special reports are made by officers of various forestry societies, National and State. These sum to authentic and instructive records of the subject as a whole.

"The National Park Service is given as it is carried forward in the various parts of the country. The rangers come on for picturesque and enjoyable accounting. Professional schools are described in their origin, support, program and contribution to the subject of practical forestry as a whole. The work of women's clubs in co-operation with the governmental agencies of reforestation is described, as is that of the American Legion.

"No more interesting topic appears here than that bearing upon game protection, upon the sanctuary and refuge for animals. Humane and practical, this is finely suited to the study of children who are going to look after the woods and their people tomorrow and the next day. While this record is, as matter of course, addressed to the grown folk, to the workers in the present, the point of carrying it as far as possible into the daily life of the children is one so vital, so momentous to both children and the subject itself that it cannot be too much emphasized—so it seems to me.

"An important unit in this useful record is that which covers the relations of business with the subject of forestry. 'What Some Lumber Companies Are Doing' is, in the main, a practical refutation of the saying that business is heartless and so on. That business has been senseless seems to be an equally true conclusion. That industry is coming to see the folly of destruction with no measures set for replenishment turns out to be the most hopeful outlook for the future of the forests.

"Here are given the ways and means by which great lumber corporations are meeting this issue in the spirit of both progress, safety and continuing business. Practical men of successful experience contribute to this view of modern enterprise in relation to the future forest supplies.

"To this rounded and complete survey of the subject of forestry in all of its many implications is added the very interesting and useful account of 'The Charles Lathrop Pack Forestry Trust,' a foundation organized upon sound business principles for the perpetuation of the great and high mission of saving the forests to the people of the United States, and to their children forever. A great mission, that, in a quiet and unspectacular way, is making advance toward a most splendid achievement. An unassuming lover of his country is engaged here. A more desirable book on its own theme than 'Forestry Almanac' would be hard to find or a more engrossing one."

Public Opinion and Forest Fires

THE spirit is changing. The earnest efforts of State Forest officials, backed more and more by forest owners and public opinion, are bearing fruit. The time will soon come when uncontrolled fire in the woods is outlawed. People are realizing that timber is a valuable crop which can be grown over and over again on the same land if it is properly managed, and fire is kept out.

Maj. R. Y. Stuart,
Chief U. S. Forest Service.

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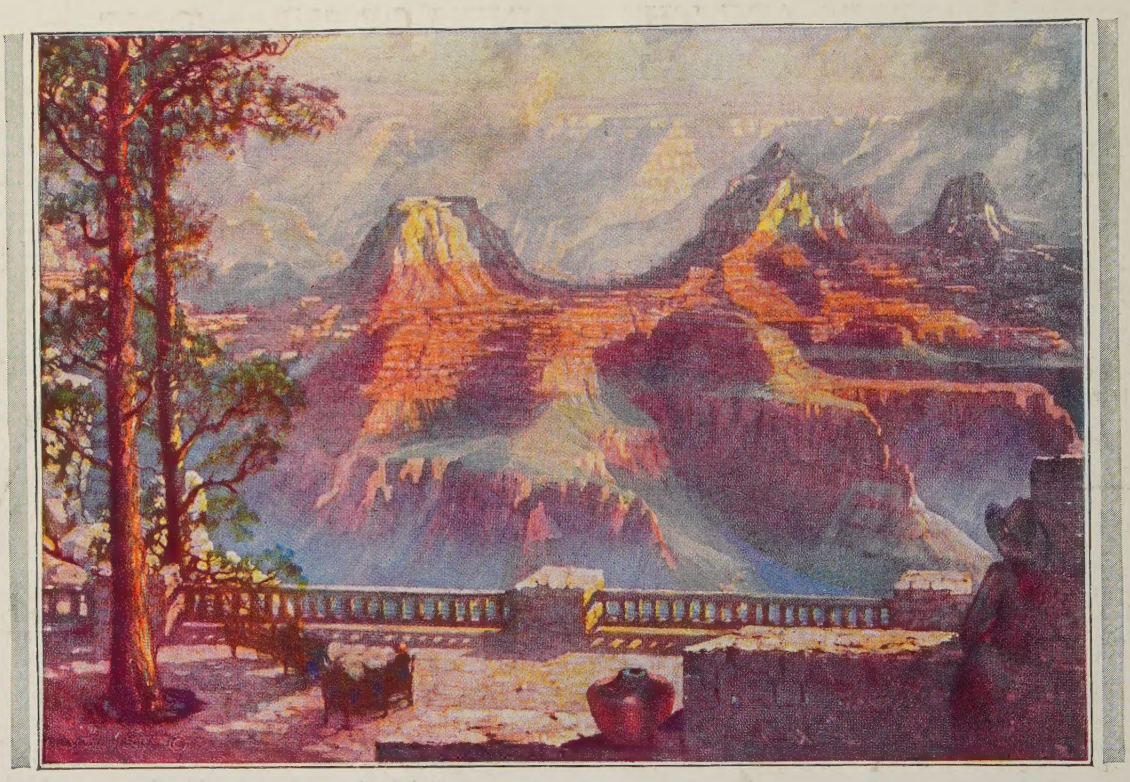

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